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Journal

of The AMERICAN DIETETIC ASSOCIATION

APRIL 1961 VOLUME 38 NUMBER 4

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Subscription Rates: $8 per year in advance in the U.S., Canada, and countries of the Postal Union; all other countries, $9 per year in advance. Special rate to undergraduate students and dietetic interns in approved internships, $4 per year in advance. All correspondence concerning Journal subscriptions, orders for copies, or reprints from the Journal, and notices of change of address should be sent to The American Dietetic Association, 620 North Michigan Avenue, Chicago 11, Illinois. Notices regarding change of address should reach the publisher by the *5th of the month before the date of issue* on which the change is to take effect and both old and new addresses *must* be given. Claims for Journals lost in the mail will not be entertained more than six months after the date of the issue involved.

Editorial Correspondence: All articles and notices for publication, general correspondence, and inquiries should be sent to the Editor at The American Dietetic Association, 620 North Michigan Avenue, Chicago 11, Illinois. Manuscripts are accepted for publication on condition that they are contributed solely to the Journal. Copy must be typewritten, double-spaced, and two copies, an original and one carbon, submitted.

Advertising: All correspondence concerning advertising should be addressed to The American Dietetic Association, 620 North Michigan Avenue, Chicago 11, Illinois.

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New Data on Underweight and Overweight Persons[1]

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New York, New York

NEW DATA on underweight and overweight have recently been brought to light as part of the most comprehensive statistical investigation ever undertaken in the health field. The investigation, known as the *Build and Blood Pressure Study, 1959,* was completed and published in 1959 by the Society of Actuaries (1). It is the latest in a series of studies begun at the turn of the century which pooled the experience of large life insurance companies in order to determine weight standards and the longevity associated with variations in build. Until the publication of the *Build and Blood Pressure Study, 1959,* the weight standards commonly used in this country were those derived in the Medico-Actuarial Mortality Investigation published in 1912, and from a comparable study completed in 1931, which indicated that there had been relatively little change in the weight of the American people in the first quarter of this century.

The new study shows that some marked changes have occurred during the past thirty years in the average weights of Americans and also in longevity associated with variations in build. It brings out clearly that moderate underweight, which at one time was properly judged to be a health handicap, is now a highly desirable condition. Overweight, on the other hand, has become a major health problem, particularly past middle life. These developments are associated with changes in the diet of the American people during the course of the past three or four decades. In the early 1900's, large sections of the population suffered from inadequate diets, or undernutrition; in recent years, overeating has become widely prevalent. This shift takes on added significance when viewed in the light of changes in the general health picture. Tuberculosis, pneumonia, and other infectious diseases were the leading causes of death in the United States two generations ago and took an especially heavy toll among the poorly nourished. At present, the cardiovascular and other degenerative diseases are the dominant factors in mortality, and these conditions are responsible for most of the excess mortality among overweight individuals.

[1]Presented at the 43rd Annual Meeting of The American Dietetic Association in Cleveland, on October 21, 1960.

Build and Blood Pressure Study, 1959

Before discussing some of the more important findings of the *Build and Blood Pressure Study, 1959,* I should like to give you some background information about its scope and basic data. This investigation embraced the combined experience of twenty-six large life insurance companies in the United States and Canada between 1935 and 1954. The portion of the study relating to longevity according to variations in build involved observation of nearly 5 million insured persons for periods up to twenty years. These insured persons resemble the general population closely, because they include a sizeable proportion of wage-earners and a representative portion of the later immigrant stocks. Approximately 4 million of the policyholders were men and 1 million women. Average weights and weight distributions were determined from a stratified sample of about 350,000 insured persons. Only insured lives in the age range from fifteen through sixty-nine were included. For information about average weights of Americans aged sixty-five and over in the general population, the reader is referred to a paper by Master, Lasser, and Beckman (2).

The weights recorded in the new insurance study were for people in ordinary indoor clothing, and the heights were with shoes. Upward of 80 per cent of the insured persons were reported to have been actually weighed at the time of examination for life insurance; an even higher proportion were weighed where the weights were beyond the normal range. Nude weights for men are estimated to be from 7 to 9 lb. less than those in ordinary indoor cloth-

ing; those for women are estimated to be from 4 to 6 lb. less.

Heights were actually measured in over 90 per cent of the cases. In the case of men, the heights in shoes exceed the barefoot height uniformly by about 1 in.; in the case of women, the barefoot heights average about 2 in. below the heights in shoes, but the differences in individual cases may vary widely depending on the height of heels.

Average Weights

The *Build and Blood Pressure Study, 1959* developed average weights for men and women for each inch of height in the range from 5 ft. even to 6 ft. 4 in. for men and from 4 ft. 10 in. to 6 ft. even for women. Comparison of these data with those in earlier studies indicates that the average weights of men and women have changed significantly in a generation, and that the trend for the two sexes has been in opposite directions. The average weights for women today are consistently lower than the weights in the investigation made about thirty years ago. Women in their twenties average about 5 or 6 lb. less than their counterparts a generation ago; even at the oldest ages, women are now a few pounds lighter. To some extent these decreases in weight reflect the lighter weight clothes now worn by women, but for the most part they represent the successful efforts of weight- and diet-conscious women to keep their weights down.

In contrast, men's average weights, particularly in their twenties and thirties, have increased about 5 lb.; in general, the increase in weight has been smaller at the older ages and for tall men. The rise in men's average weights is believed to reflect the combined effect of better nutrition and of reduced expenditure of energy due to labor-saving devices and more sedentary activities. Nutrition education can make a major contribution to the health of the nation by continuing to emphasize the need for a proper balance between food intake and energy expenditure under modern living conditions. This problem is likely to become more acute as the trend toward automation accelerates.

Nutritionists will also be interested in the relation found between weight and age. Both men and women tend to gain weight as they grow older, but the pattern of the increases differs for the two sexes. Men put on weight most rapidly in their twenties and thirties; after that, the rate of increase in men's weight is quite small. Among women, the most rapid increase in weight comes somewhat later, chiefly in the mid-thirties and forties.

The study shows that one-fifth of the adult male population is 10 per cent or more above average weight, taking into account height and age; one in every twenty men weighs 20 per cent or more than the average. Even higher are the corresponding proportions of overweight women—about one-fourth are 10 per cent or more above average and one in every nine weighs 20 per cent or more above average. Over the years, the proportion of overweights has increased somewhat for men and decreased for women. The proportion of underweight men has remained about the same, but that of underweight women has increased. The fact that the proportion of both underweight and overweight is higher for women reflects the greater variability of weights among women.

Desirable Weights

It is important to distinguish between average weight and desirable weight, that is, between what people *do* weigh and what they *should* weigh by the criterion of greatest longevity. Broadly speaking, the new study shows that past age thirty, *desirable* weights are within a range of 15 to 25 lb. below *average* weights. However, no single value can be designated as the desirable weight for all persons of a specified height, since individuals vary in many respects. The new tables of desirable weights constructed by the Metropolitan Life Insurance Company (3) on the basis of available anthropometric studies and data from *Build and Blood Pressure Study, 1959,* take into account, in addition to height, body frame. The main determinant of body frame was body width, as measured by chest breadth and hip width. The Metropolitan's tables of desirable weights show ranges of weight for each height and size of body frame, subdivided into large, medium, or small; the separate tables for men and women, as they appear in the Metropolitan's booklet, *How to Control Your Weight* (4), are shown in Table 1.

As a rule of thumb, if people kept their weight down to the average in the early twenties, they would be close to the desirable weights at ages over thirty. Only in the teens is some degree of overweight still an advantage, but this advantage is less pronounced than it was years ago, and is probably only temporary.

It may be noted that the Subcommittee on Nutrition of the New York County Medical Society in an article in the *Journal of the American Medical Association* (5) reproduced the Metropolitan's new tables and recommended that physicians give heed to the new figures. The new desirable weights are generally lower than those shown in earlier tables developed by the Metropolitan in the early 1940's and also exhibit a wider range of variation for each height and frame class.

The overweight problem appears in a more serious light when desirable weights instead of average weights are taken as a standard. It is an arresting fact that about half the men in their thirties are at least 10 per cent above their optimal weights and that one-fourth exceed their desirable weight by 20 per cent or more. The situation is even more unfavorable at the older ages. More than three out of

TABLE 1 Desirable weights for men and women, according to height and frame, ages twenty-five and over*

HEIGHT (in shoes)	WEIGHT IN INDOOR CLOTHING		
	Small frame	Medium frame	Large frame
	Men		
	lb.	*lb.*	*lb.*
5 ft. 2 in.	112–120	118–129	126–141
5 ft. 3 in.	115–123	121–133	129–144
5 ft. 4 in.	118–126	124–136	132–148
5 ft. 5 in.	121–129	127–139	135–152
5 ft. 6 in.	124–133	130–143	138–156
5 ft. 7 in.	128–137	134–147	142–161
5 ft. 8 in.	132–141	138–152	147–166
5 ft. 9 in.	136–145	142–156	151–170
5 ft. 10 in.	140–150	146–160	155–174
5 ft. 11 in.	144–154	150–165	159–179
6 ft.	148–158	154–170	164–184
6 ft. 1 in.	152–162	158–175	168–189
6 ft. 2 in.	156–167	162–180	173–194
6 ft. 3 in.	160–171	167–185	178–199
6 ft. 4 in.	164–175	172–190	182–204
	Women†		
4 ft. 10 in.	92– 98	96–107	104–119
4 ft. 11 in.	94–101	98–110	106–122
5 ft.	96–104	101–113	109–125
5 ft. 1 in.	99–107	104–116	112–128
5 ft. 2 in.	102–110	107–119	115–131
5 ft. 3 in.	105–113	110–122	118–134
5 ft. 4 in.	108–116	113–126	121–138
5 ft. 5 in.	111–119	116–130	125–142
5 ft. 6 in.	114–123	120–135	129–146
5 ft. 7 in.	118–127	124–139	133–150
5 ft. 8 in.	122–131	128–143	137–154
5 ft. 9 in.	126–135	132–147	141–158
5 ft. 10 in.	130–140	136–151	145–163
5 ft. 11 in.	134–144	140–155	149–168
6 ft.	138–148	144–159	153–173

*From Supplement to How to Control Your Weight (4).
†For girls between 18 and 24 years, subtract 1 lb. for each year under 25.

every five men in their fifties are at least 10 per cent above their desirable weight and about one-third are at least 20 per cent above that weight. For women, the proportion at least 10 per cent above desirable weight is appreciably less than for men at ages under forty, but is about the same in the forties and greater beyond that age.

Translating these percentages into numbers of persons brings out that 6 million American men in their thirties are 10 per cent above their desirable weight, and nearly 3 million are 20 per cent or more above it.

The proportion of men and women who are below their optimum weight is much smaller than the proportion above it. Only 13 per cent of the men in their twenties are 10 per cent or more below their desirable weight; the figure is even smaller at ages thirty and over. Among women, the proportion below desirable weight is materially greater than among men at ages under forty, but above this age, the differences between the two sexes are small.

Effect of Overweight on Longevity

The epigrammatic expression, "the longer the belt line, the shorter the life line," summarizes a basic truth. Three investigations spanning a period of more than seventy years indicate clearly that overweight shortens life, and that the excess mortality rises more than proportionately as the degree of obesity increases.

The *Build and Blood Pressure Study, 1959* shows that men in the age range forty to sixty-nine who were 10 per cent overweight (as measured from average weight) experienced mortality 10 to 15 per cent higher than the average of all persons accepted for standard insurance; those who were 20 per cent overweight showed 20 to 25 per cent excess mortality; those who were 30 per cent overweight experienced 40 to 45 per cent excess mortality; and men who were 40 per cent overweight showed mortality of at least 70 per cent above that of standard risks. The latter figures on the toll of life attributable to marked overweight understate the excess mortality actually associated with obesity, inasmuch as life insurance companies exercise considerable care in insuring markedly overweight persons, particularly at the older ages.

Thus, it is not surprising to find that the mortality of overweight men shows up even more poorly when compared with that for men in the *desirable* weight range. Those who are 10 per cent or more overweight have a mortality one-third higher than the men with optimal weights. For men 20 per cent or more overweight, the excess mortality is about one-half. The adverse effect of overweight is brought out even more strikingly when measured in terms of decrease in life expectancy. For example, men at age forty-five who are of medium height and of about average weight have an expectation of life one and a half years less than men of comparable build who are within the range of desirable weights. Men of the same age and height who are 20 per cent above average weight may expect to live four years less than those with desirable weights.

The health and longevity of women are also adversely affected by overweight, but to a lesser extent. For any degree of overweight, the excess mortality among women is less than it is among men.

In both sexes, increased mortality of overweight persons is due primarily to their excessive death rate from the cardiovascular-renal diseases. To illustrate, among men 20 per cent or more overweight, mortality from the heart and circulatory diseases was more than two-fifths higher than that among standard risks. For cerebral hemorrhage and other vascular disorders of the central nervous system, the excess mortality exceeded 50 per cent, and for nephritis it was nearly 75 per cent. Other diseases contributing appreciably to the increased mortality among overweights were diabetes mellitus

and diseases of the digestive system, mainly biliary tract and liver disorders. The diseases chiefly responsible for the excess mortality among overweight individuals are the major killers today.

EFFECT OF OVERWEIGHT PLUS MINOR IMPAIRMENTS

One of the most significant findings of the *Build and Blood Pressure Study, 1959* is the extent to which some impairments generally considered to be of minor significance increase the mortality of overweights. In this study, any impairment was considered to be of minor significance if it alone did not bar an applicant from obtaining standard insurance. The mortality of overweight men with moderate elevation of blood pressure was about one and a half times as great as that of overweights with no known minor impairments. Similiarly, overweight persons with small or moderate amounts of albuminuria when examined for life insurance experienced an increase in mortality of about 30 per cent. The mortality among overweight men with a family history of early cardiovascular-renal diseases was 35 per cent above that for overweight men without known minor impairments.

Overweight, together with elevation in blood pressure, affects mortality adversely even in cases where the overweight is not of sufficient degree to bar the applicant from standard insurance. In general, the combination of overweight and elevated blood pressure produced an excess mortality significantly higher than that expected from the extra mortality associated with each impairment separately.

Men who were markedly overweight and had appreciably elevated blood pressure experienced mortality from three to four times that for standard risks.

Effect of Weight Reduction on Mortality

Probably no aspect of the *Build and Blood Pressure Study, 1959* is of greater interest to dietitians than the new evidence that weight reduction has a favorable effect on mortality and longevity. A separate investigation was made of the records of policyholders who were charged an extra premium because of overweight at the time they were insured but who later qualified for insurance at standard premium rates because they had reduced their weight sufficiently and maintained the lower weight for some time. The overweight men who reduced had practically the same mortality as standard risks for some years following the change in premium class. The experience was analyzed in further detail according to the age of the policyholders, their height, and degree of overweight. In each category, the mortality of the men who reduced was consistently below that of overweight men who continued to pay extra premiums.

A few figures will illustrate my point. Men who averaged about 25 per cent overweight at the time they were insured experienced a mortality about 30 per cent above the average for standard risks. By way of contrast, men originally rated substandard because of overweight, who later qualified for standard insurance because of sustained weight reduction, following the removal of their substandard rating, experienced a mortality less than 10 per cent above that of standard risks. The disparity was even greater for markedly overweight men, that is, those about 35 per cent overweight. Among them, the mortality was about 50 per cent greater than that for standard risks; however, those who reduced experienced mortality not materially different from that of standard risks for a number of years following sustained weight reduction.

It is probable that those who reduce and persevere in keeping their weight down are a select group. However, evidence of the benefits from weight reduction available from other sources indicates that such self-selection is only a partial explanation of the favorable findings. For instance, clinical experience supports the benefits of weight reduction. In my judgment, the decrease in average weights of women in this country during the past thirty years and the marked improvement in their mortality during this period as compared with men are not unrelated.

It is also noteworthy that blood pressure tends to rise with increasing degree of overweight and that there is some evidence that weight reduction among those with slightly elevated blood pressures is accompanied by a reduction in blood pressure.

Implications of the New Information

The question now is: what are the implications of these findings for dietitians and nutritionists? What can these facts and figures contribute to increase the effectiveness of the programs on weight control in which you participate and what additional steps do they suggest?

First, it is clear that today overweight is a health and nutritional problem of major proportions in our country and efforts to deal with it should be commensurate with its importance. You people have a great responsibility for focusing attention on the problem, as well as many opportunities to help solve it. But the task of weight control is so large that it requires cooperative efforts of many other individuals and agencies, such as physicians, nurses, public health workers, and life insurance companies. Many of you are familiar with the work of the Metropolitan Life Insurance Company in this field. It has been given new impetus by the findings of this new study. I may mention, for example, the exhibit on weight control which was presented in 1960 at the Annual Meeting of the American Medical Associa-

tion, and which will be shown at many other medical and public health meetings in the coming year. In this and other ways, we continue to stimulate the interest of physicians in the problem of weight control.

Second, the figures I have cited suggest sharper areas of focus with respect to sex and age in your weight control activities. For men, particular attention needs to be given to eating habits in early adult life, for it is then that they show the greatest tendency to put on extra pounds. As part of your program in this field, you will want, in your contacts with young homemakers, to stress the need to serve their husbands meals in which the calories are in balance with energy requirements. This emphasis is an essential part of the Metropolitan Life Insurance Company's current efforts in weight control and there is now available a new health pamphlet, "Weight Control—A Word to the Wives" (6), emphasizing just that point.

The findings of the new study suggest further that, for women, special efforts should be made in the weight control program to reach those in their middle thirties. As we have seen, average weights of younger women have decreased. After age thirty-five, this is much less true, and there is a tendency for women then to put on weight.

The results of the new study are the basis of the Metropolitan's new desirable weight tables. These re-emphasize the wide range of normal variation in the weights of individuals due to differences in body structure. Accordingly, weight control programs for individuals need to take such variations into account, *but* you must not let patients delude themselves into thinking that their excess weight is due to a large frame. These tables should be applied honestly and critically.

While the results of the new study indicate new points of emphasis in your efforts in weight control, you should not neglect other fundamental aspects of the matter, such as teaching and inculcating good eating habits in children and young people, and as part and parcel of this to aim at prevention of overweight. Weight reduction likewise must continue to be a large and important aspect of the job of weight control in which you play a vital role. Dietitians can do much in helping individual patients under treatment, since the physician himself often does not have time to give patients necessary detailed dietary instruction that must be followed to achieve necessary weight reduction. Simply handing a patient a diet list is seldom of real help. Individual or class instruction is needed so that patients understand what they are doing and why.

Consider, too, whether in your regular tasks—whether in hospital work or institutional, commercial, or industrial food services—you are making the most of your opportunities to teach people what they need to know about their caloric needs and the caloric values of foods.

One more thing, though it be impertinent, I would stress the importance of a good example. No dietitian should be fat.

Fortunately, unlike many of our health problems, overweight is, to a substantial degree, amenable to control. Experience has shown, however, that there are many difficulties in helping people carry through weight reducing programs to a successful end. Backsliding is all too frequent, as studies of weight reduction invariably show. There is obviously need for further research on many aspects of the overweight problem, particularly the psychologic and emotional factors and the physiologic mechanisms involved in weight reduction. Until new facts are brought to light, it is urgent that existing knowledge be fully and effectively utilized. Overweight will continue to be a major problem in our country as the tasks of everyday living are increasingly lightened by new labor-saving devices in the factory, office, and home, and as more and more people reach the ages where the cardiovascular diseases are dominant causes of sickness and death.

References

(1) Build and Blood Pressure Study, 1959. Vol. I. Chicago: Soc. of Actuaries, 1959.
(2) MASTER, A. M., LASSER, R. P., AND BECKMAN, G.: Tables of average weight and height of Americans aged 65 to 94 years. Relationship of weight and height to survival. J.A.M.A. 172: 658, 1960.
(3) New weight standards for men and women. Met. Life Ins. Co., Statistical Bull. 40: 1 (Nov.-Dec.), 1959.
(4) How to Control Your Weight. N. Y.: Met. Life Ins. Co., 1960.
(5) SUBCOMM. ON NUTRITION, N. Y. COUNTY MED. SOC.: New height-weight tables. Importance of new criteria. J.A.M.A. 173: 1576, 1960.
(6) Weight Control—A Word to the Wives. N. Y.: Met. Life Ins. Co., 1960.

The Popularity of Dessert

Seventy per cent of 1892 homemakers surveyed by *Good Housekeeping* recently indicated that they serve dessert on a regular basis with dinner. Of these, 25 per cent reported that they try to serve "low-calorie" desserts and 10 per cent that they use "diabetic" ice cream—all of which simply confirms the current preoccupation with dieting and weight reduction.—*From Food Field Reporter, September 26, 1960.*

Disturbances in Body Image of Some Obese Persons[1]

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OF ALL THE forms of neurotic behavior to which obese persons are subject, only two seem specifically related to their obesity. The first is overeating, the second is a disturbance in the body image. This paper deals with the disturbances in body image which were reported by some of a group of nearly one hundred obese men and women studied in the General Medical and Psychiatric Clinics of the Hospital of the University of Pennsylvania.

The term "body image" refers to the concept which each individual has of his own body as an object in space, independently and apart from all other objects (1). The body image develops in infancy and childhood, is radically altered during the rapid growth period of adolescence, and is such a completely natural part of our existence that only when it is disturbed do we see just how important a part it plays in our lives. Disturbances in body image occur most commonly and dramatically in acute brain damage and in schizophrenia, and persons suffering from these conditions may show bizarre distortions in the perception of their bodies (2-4).

The disturbances in body image which we have observed in certain obese persons are quite different from those which occur in brain-damaged and schizophrenic persons. In those obese persons so afflicted, the body image disturbance takes the form of an overwhelming preoccupation with one's obesity, often to the exclusion of any other personal characteristic. It may make no difference whether the person be also talented, wealthy, or intelligent; his weight is his only concern, and he sees the whole world in terms of body weight. These obese patients may even divide society into persons of differing degrees of overweight, and their orientation towards others may be largely in terms of this division. They envy persons thinner than they and feel contempt for ones who are fatter. At the center of this attitude is the appraisal of one's own body as grotesque and even loathsome, and the consequent feeling that others can look on him only with horror and contempt.

One might expect that derogatory feelings about one's body could occur in any obese person and that it might well be the central feature of the neurosis of all emotionally disturbed obese persons. Such is not the case. Body image distortions do not occur in emotionally healthy obese persons, and we have found them in only a minority of emotionally disturbed obese persons.

Illustrations of the Disorder

The distinctive character of the body image disturbance is perhaps best illustrated by verbatim accounts of obese persons, some of whom show the disturbance and some of whom do not. A person's concept of his body is often revealed by his feelings on looking at himself in the mirror. We have systematically collected spontaneous references to this topic. An obese man who suffered from a disturbance in body image said, "Just looking at myself in a store window makes me feel terrible. It has gotten so I am very careful not to look by accident. It's a feeling that people have a right to hate me and hate anyone who looks as fat as me. As soon as I see myself, I feel an uncontrollable burst of hatred. I just look at myself and say 'I hate you, you're loathsome.'"

As we have indicated, this disturbance in body image is not present in all obese persons. For example, an obese man who did not suffer from a disturbance in body image took the following casual view of his appearance, "You know, I caught a glimpse of myself in the mirror this morning, and I was surprised at how fat I have become. It made me feel that it's time for me to get some of this weight off."

Another aspect of the disturbance in body image

[1]This work was supported in part by grant No. M-3684 from the National Institute of Mental Health, National Institutes of Health, Bethesda, Maryland. Presented at the 43rd Annual Meeting of The American Dietetic Association in Cleveland, on October 21, 1960.

is revealed by the misperception of others which persons suffering from disturbances in body image often describe. It sometimes seems as if they feel that nothing in the world happens to them except in some kind of (usually derogatory) relationship to their weight. At times, these misperceptions have a delusional quality, but the delusion rarely if ever spreads beyond the idea of overweight. For example, one obese man said, "My overweight makes me withdraw from people. I think that they look down on me. They laugh at me even though I keep trying to tell myself that they don't mean anything by it."

Another man reported, "Weight was always a problem. If I missed a note in my music class and someone said 'you always mess it up, man' then I would think, 'maybe it's because of my weight.'"

By contrast, persons not suffering from body image disturbances rarely commented on how others regarded them. When asked specifically about this point, one obese man reported, "The cosmetic point of view really bothers me only indirectly—through my wife. She objects to it; I think that she thinks a lot about it."

The sensitivity on the part of the body image patients to how others regarded them was most striking in their relationship with the opposite sex. Such patients usually had serious disturbances in their sexual relationships, and few if any of them had achieved even a satisfactory marital adjustment. One young man with a strong, and quite unfulfilled, sexual desire said, "I just don't see anyone as fat as I am as a suitable sexual partner. If I were a girl I wouldn't want me for sex." An attractive young woman who, in other days, would have been considered pleasingly plump put in even more succinct terms her despair over the possibility of marriage, "Who would want to marry an elephant?" By contrast, an obese man with no body image trouble boasted, "I can get a woman any time I want to. I'm a good looking guy, and if you know anything about how women are, you know that I can get one without any trouble."

Predisposition to the Disorder

Three factors predispose to the development of a disturbed body image in obese persons. These factors are: age of onset of obesity, presence of neurosis, and parental evaluation of the obesity.

The first, and to us the most surprising, factor is the age of onset of the disturbance. It occurs almost exclusively in persons who became obese during childhood or adolescence. Over half of the patients we have studied became obese in adult life and we have rarely found one, no matter how neurotic in other ways, who reported disturbances in body image. Not everyone, however, who became obese before adult life developed a disturbed body image. Indeed, half have escaped this disorder. Thus it appears that becoming obese during childhood or adolescence is a necessary but not a sufficient cause of the disorder we have described. Two additional factors seem necessary.

The presence of a disturbed family environment during childhood and the development of emotional disturbance predispose to the development of disturbances in body image. A secure childhood and a stable personality, on the other hand, seem to prevent such disturbances. We have yet to see an obese person with a disturbed body image who does not show other significant emotional disturbances.

The third factor in the development of a disturbed body image is a detrimental parental evaluation of the person's obesity when he was a child. In a disturbed family environment, a child's obesity all-too-often becomes the focus of parental hostility and contempt, and he grows up with similar derogatory views of his obesity and himself. If, however, the family does not derogate obesity, it appears that even a neurotic obese child may escape a disturbance in body image. In the rare instance when the family values large size and views the childrens' overweight as a sign of strength and health, the presence of obesity may even heighten self-esteem (5). This seemed to be the case in two obese men who had been football players and who thought of their size in terms of strength and manliness.

Intelligence and Disturbed Body Image

One curious aspect of the body image problem is the difference in intelligence between obese persons suffering from disturbances in body image and those not so afflicted. In the first, unselected sample of subjects, the intelligence quotient of the body image patients was 121 $\pm$ 17, whereas that of the unaffected subjects was 106 $\pm$ 19. No reason for this disparity has been discovered. It did, however, cause us to wonder whether the differences in reports of body image disturbance might be simply a result of differences in intelligence. It seems reasonable, for example, that a more intelligent person might also be more introspective and more articulate and that he might therefore more readily report disturbances in body image than would less intelligent persons. Accordingly, in a recent selected sample, we have controlled for intelligence. Preliminary results indicate that the differences in reports of body image disturbance are not due to differences in intelligence.

There is considerable instability in the body image disturbances, and they fluctuate widely in intensity even over short periods of time. The factor determining the intensity of the disturbance is the mood of the person, rather than his body weight. Disturbances in body image may persist long after successful weight reduction, a point well documented by Bruch in her description of "thin fat people" (6). Fluctuations in mood, on the other hand, may

result in marked fluctuation in the intensity of the body image disturbance. When things are going well and a body image patient is in good spirits, he may be troubled little or not at all by such matters. Let things go badly, however, let a depressive mood ensue, and at once all of the derogatory and unpleasant things in the person's life become focused upon his obesity, and his body becomes the explanation and the symbol of all his unhappiness.

Just as body image disturbances fluctuate in intensity with short-term changes in mood, so may they be more permanently altered by more enduring changes in the personality of the obese person. In the few instances in our experience where it has been successful, prolonged intensive psychotherapy has favorably altered the body image disturbances of the obese person, even when the obesity itself was not eliminated. As one young man put it, "It's strange to see myself in the mirror looking so fat, because I feel so differently about it now. I *feel* thin."

Discussion

The more we have become familiar with obese persons, the more we have been impressed with the need for specificity in linking neurosis and obesity. Anyone who takes the time to talk with them soon learns that many obese persons have a great many neurotic problems. From this fact, too many of us have inferred that the neurosis is a cause of the obesity. On methodologic grounds alone, this is a shaky inference. But the results of recent surveys of mental health make it quite clear just how cautious we must be in associating neurosis and obesity. One of the best of these studies indicates that only about 20 per cent of the population can be considered unequivocally mentally healthy (7). In 80 per cent of the population, some degree of neurotic disturbance was found. Now if four out of five of the general population are neurotic, it is clear that by chance alone we are going to find a good many obese persons who are also neurotic. It is, therefore, no longer sufficient to cite the presence of neurosis in an obese person as an explanation of his overeating, or even as necessarily relevant to his obesity. The manner in which the neurosis is related to the obesity must be specified. Our description of the disturbances in body image of some obese persons is an effort in this direction.

The results of treatment of persons suffering from disturbed body image indicate that prolonged intensive psychotherapy may be able to modify significantly this disturbance, even when the obesity itself is not eliminated. However, such treatment is hardly practicable for the large number of obese persons who suffer from disturbances in body image. It would appear that if this problem is to be effectively managed, it must be by prevention.

Here, then, is a compelling reason for the prevention of obesity in childhood. It should not be concluded, however, that the prevention of obesity in childhood will prevent the development of neurosis in children who are raised in tense and insecure surroundings. It could even be contended that if a person is to be neurotic, it matters little whether he is neurotic about his weight or about something else. We believe that it does matter. Once obesity becomes entwined in neurosis in the manner we have described, both the neurosis and the obesity become much harder to treat. For the obese person's secret inner feelings of inadequacy and self-hatred are given enough external support by the attitudes of others towards his obesity to make them even harder to overcome. And once a person has developed a severe distortion in body image, his body serves as an explanation and symbol of disappointments and failures, even without the contribution of other persons. It is our impression that if a person is to be neurotic, he will have an easier time of it, all things considered, if he does not carry into adult life the burden of obesity and the so-frequently-associated disturbance in body image.

Why the entwining of neurosis with obesity creates such a difficult problem is still unclear. One explanation is that this is the only condition which involves at the same time a disturbance in bodily integrity and a disturbance in impulse control. Both of these problems are serious enough when they occur separately (8, 9), but their simultaneous occurrence makes each more malignant. Consider, for example, the effect on a person of the congenital deformities such as hare lip or the traumatic deformities such as facial scarring. Both are likely to influence the body image in an unfavorable manner and to pose difficulties in adjustment. However, in no such disturbance of bodily integrity is the afflicted person considered by society to be responsible for his condition. The obese person, on the other hand, is generally held accountable for his obesity, and external sanctions reinforce his private sense of failure and guilt.

If we consider the disorders in impulse control, such as alcoholism, drug addiction, and delinquent behavior, we find that few if any stigmata of the behavior persist beyond its termination. The alcoholic may appear at work with no tell-tale signs of his riotous bender of the day before, and the drug addict is notoriously difficult to detect by his appearance. Not so the obese person! The all-too-evident scars of his intemperance make his overeating a matter of general knowledge, and his every private misery is accorded a public reinforcement.

Summary

A disturbance in body image occurs in some emotionally disturbed obese persons. This disturbance

is marked by a feeling that one's body is grotesque and loathsome and that others can view it only with hostility and contempt. These disturbances in body image do not occur in emotionally healthy obese persons, and probably in only a minority of emotionally disturbed obese persons. They may persist long after successful weight reduction.

A critical factor in the development of a disturbed body image appears to be the age of onset of the obesity. It rarely if ever occurs in persons who have become obese during adult life. It occurs in persons in whom the following three conditions have been satisfied: (a) the person was obese before becoming an adult, (b) the person suffers from an emotional disturbance, and (c) the obesity was the focus of derogatory parental concern.

Although prolonged intensive psychotherapy can modify these disturbances in body image, such a measure can hope to help only a small number of the many persons suffering in this manner. A more fruitful approach appears to be the preventive one. The prevention of obesity in childhood might greatly reduce the occurrence of disturbances in body image among obese persons.

References

(1) HINSIE, L. E., AND CAMPBELL, R. J.: Psychiatric Dictionary. 3rd ed. N.Y.: Oxford Univ. Press, 1960, p. 370.

(2) SCHILDER, P.: The Image and Appearance of the Human Body. Studies in the Constructive Energies of the Psyche. N.Y.: International Universities Press, 1950.

(3) WEINSTEIN, E. A., AND KAHN, R. L.: Denial of Illness: Symbolic and Physiological Aspects. Springfield, Ill.: Charles C Thomas, 1955.

(4) KOLB, L. C.: Disturbances of the Body-Image. *In* American Handbook of Psychiatry. Vol. I. (Arieti, S., ed.). N.Y.: Basic Books Pub. Co., 1959, p. 749.

(5) BRUCH, H.: Obesity in childhood and personality development. Am. J. Orthopsychiat. 11: 467, 1941.

(6) BRUCH, H.: The Importance of Overweight. N.Y.: W. W. Norton & Co., Inc., 1957.

(7) MICHAEL, S. T.: Social attitudes, socio-economic status and psychiatric symptoms. Acta Psychiat. et Neurol. Scandinar. 35:509, 1960.

(8) FENICHEL, O.: The Psychoanalytic Theory of Neurosis. N.Y.: W. W. Norton & Co., Inc. 1945, pp. 324-387.

(9) MACGREGOR, F. C., ABEL, T. M., BRYT, A., LAUER, E., AND WEISSMAN, S.: Facial Deformities and Plastic Surgery: A Psychosocial Study. Springfield, Ill.: Charles C Thomas, 1953.

Children in the United States

The following excerpts are taken from Children in a Changing World, *a book of charts prepared in advance of the Golden Anniversary White House Conference on Children and Youth to provide background for participants.*

The child population is becoming concentrated in a few states; seven states (New York, Pennsylvania, Ohio, Michigan, Illinois, Texas, and California) now have 44 percent of all children under eighteen years of age.

* * * *

Thirty per cent of the mothers with children under eighteen years old are working, and about 20 per cent of those with children under six are employed.

* * * *

In 1901, 80 per cent of urban family income was spent for food, housing, and clothing—the necessities. In 1956, less than 60 per cent. In 1901, 40 per cent of the family budget went for food, but in 1956, only 25 per cent.

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Prematurity (babies weighing 2500 gm. or less at birth) causes many deaths. In 1957, immaturity or low birth weight was the underlying or contributing cause of 49,230 deaths of infants under one year of age.

* * * *

Many children have poor diets. Many adolescent boys and girls are getting less of some essential dietary elements than is considered desirable. In general, the diets of adolescent girls are likely to be poorer than those of adolescent boys. The diets of young children are somewhat better, but they, too, show shortages. In this age group, about 25 per cent get less than two-thirds of the recommended allowance for ascorbic acid; 20 per cent have diets low in calcium, and 5 to 10 per cent have diets that are short in other respects.

* * * *

Surplus food is distributed to families and institutions, the amount distributed increasing annually since 1953. In the second quarter of 1959, foods donated by the program were used by about 1.4 million persons in charitable institutions, plus 4,715,349 needy persons residing in family units.

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During the school year 1958-59, more than 12 million children in almost 61,000 schools participated in the national school lunch program. Of the total school enrollment, 30.5 per cent participated.

Some Preliminary Findings

Body Composition of Young Women[1]

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FOR SOME TIME our laboratory has been interested in obesity and the metabolic responses of young people during weight reduction (1-5). More recently the senior author has been concerned with body fatness and nitrogen metabolism in young women while reducing (6). In this connection, we became aware of the paucity of data on the lean body mass and/or adiposity of normal women; in the literature were only two papers. Chen, in the *Journal of the Formosan Medical Association*, gave (7) specific gravity figures for sixty-five Minnesota women clinically free of disease. Twenty-five of these were between eighteen and thirty years of age. Skerlj, Brozek, and Hunt (8) reported subcutaneous fat and age changes in body build and form for the same women. The only other study giving density figures for women was that of Allen *et al.* (9) with twenty-nine young Chinese university women. Hence it seemed worth while to obtain normative data on the lean body mass and fatness of a representative sampling of young women. Originally the objective was limited to women of seventeen to thirty years old, the group on which a preliminary report will be given here. The objective has since been expanded to include women sixteen to seventy years of age. These data will be reported later.

The investigation had a second and equally important objective. Obviously all attempts to measure fatness in the living human must be by indirect means. A number of such means have been used by various investigators. Perhaps the most basic method has been to measure the density of the living body in which the volume most frequently has been obtained by underwater weighing. Behnke *et al.* (10) started the modern application of this technique. Brozek *et al.* (11), of the Laboratory of Physiological Hygiene, University of Minnesota, have refined the method and made it more precise by providing for the measurement of residual air in the lungs at the moment the underwater weight is taken. From several laboratories have come considerable data for men.

Lean body mass and hence relative adiposity have also been estimated, especially in men, from various body water determinations, either total or compartmental, using different diluents.

Another indirect method has been to estimate relative fatness by measuring skinfold thicknesses (and hence subcutaneous fat layer) with calibrated calipers. The laboratories of Brozek *et al.* (8), Edwards (12), and Garn (13) have been the principal contributors of data for women. For men, where both skinfold and density measurements have been made, prediction formulas have been proposed for estimating density and hence percentage of body fat on the basis of skinfold thicknesses (14, 15). Such formulas are not available for women.

As a result of the work primarily of Garn and his associates (13) at the Fels Research Institute (though the technique was introduced by Stuart *et al.* [16] in 1940), subcutaneous fat also has been studied by soft tissue x-rays in which the thickness of fat pads are measured. Though many papers have been published, probably those concerned with fat patterning (17), quantitative assessment of body fat (18, 19), the relationship between x-ray and pinch caliper measurement of fat (20, 21), and the data on 107 women twenty to sixty years of age (13) have the greatest interest here. Garn has pointed

[1]Supported in part by grants from the National Live Stock and Meat Board, Chicago; Frank E. Gannett Newspaper Foundation, Rochester, New York; and state appropriations through the State University of New York. Presented at the 43rd Annual Meetinng of The American Dietetic Association in Cleveland, on October 20, 1960.

(22) to the need to cross validate estimates made from soft tissue x-rays with those from other techniques, such as density and body water.

Behnke *et al.* (23) have used anthropometric measurements, both skeletal and envelope, in quantifying body weight and configuration. Behnke (24) also has used skeletal dimensions obtained both from transverse joint diameters from x-rays and anthropometric measurements for estimating lean body weight. Most data have dealt with men, and Behnke has urged (25) the accumulation of similar data for women.

For years, the creatinine coefficient, i.e., creatinine excretion in milligrams per 24 hr. per kilogram body weight, has been considered a possible index of muscle mass or lean body mass. In fact, several formulas for predicting lean body mass (or similar compartments) based on creatinine excretion have been proposed (26-29). No formulations are available for women, or are based on data for women.

Finally, lean body mass has been predicted on the basis of basal oxygen consumption. For men, Miller and Blyth (26), Ryan *et al.* (29), and Behnke (30), have all studied this question; in some cases, predictive equations for body density have actually been developed (26, 30); in another instance, though a relationship existed, it was too low to permit the development of a predictive formula (29). Maximal oxygen consumption also has been related to body composition (31). Johnston and Bernstein have reported (32) data on the body composition of seventeen women and their heat production; von Dobeln (33) on thirty-five Swedish women.

Thus, estimates of body fatness have been made based on density; body water; skinfold thicknesses; measurement of fat-pad thicknesses on soft tissue x-rays; anthropometric measurements, both skeletal and envelope; transverse skeletal diameters on joint x-rays; creatinine excretion; and basal oxygen consumption. Most of the data are for men. Interrelationship between estimates made by some of the indirect methods have been studied but not between all. Predictive equations based on these interrelationships have been made in certain cases for men. Similar formulations do not exist for women because of lack of the basic data.

Hence, the second objective of this research has been to study the interrelationships existing between estimates of lean body mass and/or adiposity based on determination in each subject of body density, total body water, skinfold measurements, fat-pad measurements from soft tissue x-rays, anthropometric measures (both skeletal and envelope), creatinine excretion, and basal oxygen consumption.

Procedure

Subjects were normal women from a university community who volunteered after being told clearly just what cooperation would be involved. No one was taken who was unwilling or unable to cooperate in the entire series of determinations. Physical normalcy for the women sixteen through thirty years of age was checked by medical examinations. The older women, thirty to seventy years of age, were asked to check a medical history sheet and answer a series of questions related to physical signs and symptoms prepared by one of us[2]. Any answer which might indicate lack of normalcy led to further checking by an internist. All participants sixty years old and over were given a physical examination by the internist before acceptance. Because of the possibility in some women of premenstrual fluid retention, no tests were made ten days prior to the expected onset of menstruation or during the period itself.

ANTHROPOMETRIC; SKINFOLD; DENSITY TECHNIQUES

Each subject kept a series of three appointments. One, which took approximately an hour, occurred first thing in the morning with the subjects in a fasting state and with an empty bladder. At this time, anthropometric, skinfold, and density measurements were made in the order listed. Weight and height were taken nude, and "skeletal" and "envelope" measurements as described by Behnke (25) were made.

A Hrdlicka type of anthropometer was used for chest width at the xyphoid level and for the deltoid diameter. The Martin thin blade anthropometer was used for bi-acromial, bi-iliac, and bitrochanteric diameters. A sliding caliper, calibrated in millimeters[3], was used for bony widths: knee to knee, knee, ankle and wrist. An extremely flexible steel tape, calibrated in millimeters, was used for all circumferences measured including: shoulder; chest at xyphoid level; buttocks (greatest rearward protrusion); thigh (just below gluteal fold); abdomen at hypochondriac, umbilical, and hypogastric levels; knee; calf; ankle; biceps; forearm; and wrist. Stature and sitting heights were taken, using a right angle measuring device.

Skinfold measurements were made with a skinfold caliper[4], calibrated to exert a pressure of 10 gm. per square millimeter of jaw surface. Instructions for measurements suggested by the Committee on Nutritional Anthropometry of the Food and Nutrition Board, National Research Council (34) were used. Three successive measurements were taken at each site. Twelve sites, primarily on the right side of the body, were used:

Chin, under the mandible; below the tip of the scapula; chest, mid-axillary border of pectoralis major and at the xyphoid level on the mid-axillary line; lateral

[2] J. H. F.
[3] Swan Tool Co.
[4] Lange.

aspect of the thorax over the lower rib midway between the axilla and the iliac crest; waist on mid-axillary line, half-way between the lower rib and the iliac crest; abdomen, just to the right of the umbilicus and also, half-way between the umbilicus and the pubis on the midline; supra-iliac on the midaxillary line; upper arm, over the triceps midway between the tip of the acromial process of the scapulae and the tip of the elbow; thigh, half-way down over the rectus femoris muscle; and knee, over the patella.

Skinfold measurements were also made on the calf over the gastro-nemius muscle at the level of maximal circumference and on the buttocks at the level of greatest protuberance; these two sites proved very difficult to measure with a feeling of confidence and were not used in totalling skinfold thickness for each individual.

Density determinations were made as previously described (6) with measurement of residual air in the lungs at the moment of underwater weighing. In order to calculate body fat from density and/or specific gravity, the formulas of Rathbun and Pace (35), Behnke (36), Brozek and Keys (37), and Siri (as reported to the senior author by Behnke [25]) were used.

FAT-PADS ON SOFT TISSUE X-RAYS; JOINT DIAMETERS

At a second appointment, soft tissue and joint skeletal x-rays were made. The soft tissue x-rays were taken following the technique of the Fels Research Institute (38). Body sections used included: lower arm, deltoid insertions, lower thoracic, iliac, thigh, and leg. From these sections, thirteen fat-pads were measured. Four joints on the right side—the elbow, wrist, knee, and ankle—were taken with the x-ray beam focused directly over the joint under study using standard conditions (24).

BODY WATER; BASAL OXYGEN; CREATININE

At a third appointment, basal metabolism, body water, and creatinine excretion were measured. The subject entered the Clinical Nutrition Unit by 10 p.m. the night before the tests. First thing in the morning basal oxygen consumption was determined by an experienced technician using a metabolator.[5] The mean of two tests made under basal conditions was recorded,

For all subjects, total body water was measured with N-acetyl-4-amino antipyrine (NAAP) by means of a modification of Brodie's method (39). In subjects thirty to seventy years of age (not reported here), thiocyanate space and total body water determinations using tritium were also done. Blood and urine samples were taken at 4 hr. for the NAAP determinations. Each subject collected urine samples for an entire 24-hr. period. Daily creatinine excretion was calculated from determinations made by the micro method of Folin as described in Hawk *et al.* (40).

After all tests were completed, observed and derived data were transferred to punch cards to facilitate machine computations of means, standard deviations, and simple correlation coefficients with a computer[6]. Eventually much information may be drawn from the data at hand for women sixteen to seventy years, including normative figures, inter-correlations between various parameters, and predictive equations. This presentation is limited to a preliminary reporting of descriptive data for ninety-four young women sixteen to thirty years old, and a limited number of inter-correlations.

Results

Though not all women were from New York State, the group would seem to be fairly representative of young women of middle or upper middle class in Northeastern United States. In Table 1 are given descriptive data concerning age, weight, height, and percentage of "standard" weight. Ages ranged from 17.2 to 27.2 years, the mean being 20.36 ± 1.951. Heights ranged from just under 5 ft. to approximately 6 ft., with a mean 65.94 ± 2,374 in. Body weight, nude in a fasting condition with empty bladder, ranged from 44.11 to 76.20 kg.; the mean weight was 58.96 ± 6.445. The weights were compared with a "standard weight." No completely satisfactory standard was available for this age group. Finally, the one used was that given in the *Build and Blood Pressure Study, 1959* (41) for young women twenty to twenty-four and twenty-four to twenty-nine years of age. These figures include shoe heel height (average 2 in.) and usual indoor clothing (for women 4 to 6 lb.) and are not for fasting individuals. To make our figures as comparable to these

[5]Sanborn.

[6]Burroughs 220.

TABLE 1 **Description of subjects**

CHARACTERISTIC	RANGE	MEAN	STANDARD DEVIATION	MEDIAN
Age (yr.)	17.2 – 27.2	20.36	1.951	20.10
Height (in.)	59.38– 71.25	65.94	2.374	65.81
Weight (kg.)	44.11– 76.20	58.96	6.445	59.08
Standard weight (%)*	83.2 – 128.0	98.93	8.61	97.4
Residual air (ml.)	553 –1973	1022	272	1010

*As reported.

*Averages reported in *Build and Blood Pressure Study, 1959* (41).

conditions as possible, the average heel height of 2 in. was added to each height; 5 lb. were added to each weight to cover clothing. No correction was made for the fasting condition. Under these conditions, the ninety-four young women had a mean weight of 98.93 ± 8.61 lb. compared with a standard weight of 100. Thus the group fell largely within ± 10 per cent of the standard. If a correction were made for fasting, the figures probably would have fallen almost exactly on the standard. It seems likely, then, that the figures on density and percentage body fat for this sample of young women may be fairly typical for a normal weight population of middle or upper middle class young women.

The wide range of figures given for the residual air in the lungs at the time of underwater weighing (553 to 1973 ml.) points to the desirability of actually determining residual air when accuracy is desired rather than using an average correction term, in this case 1022 ± 272 ml.

DENSITY; SPECIFIC GRAVITY; AND PERCENTAGE FAT

Of the data presented here, greatest interest probably centers on density, specific gravity, and percentage of body weight as fat given in Table 2. Densities ranged from 1.0150 to 1.0595 gm. per cubic centimeter, the mean density was 1.0342 ± 0.0094; the median, 1.0343. Converted to specific gravity, the range becomes 1.0217 to 1.0665; the mean, 1.0408 ± 0.0094; the median, 1.0411. The only other figures for American women are those of Chen (7) for the twenty-five Minnesota women, eighteen to thirty years old (mean age, 24.4 years). These women were slightly smaller and lighter in weight (55.44 ± 6.42 kg.); mean specific gravity was 1.0458 ± 0.0099, very slightly higher than for our subjects. For the twenty-six Chinese university women (mean age, 22.6 years; mean weight, 49.3 kg.) reported by Allen *et al.* (9), mean density was 1.0397 gm. per cubic centimeter, a figure quite comparable to that for our subjects (1.0342).

Figures derived for the percentage of body fat vary somewhat with the formula used (Table 2). If the best known formula—that of Rathbun-Pace using specific gravity figures—is used, the percentage of fat ranged from 15.81 to 38.62 among the ninety-four women. The mean was 28.69 ± 4.856; the median, 28.55. These figures are very slightly higher than the 26.11 ± 5.07 reported by Chen using the same formula. The Chinese women reported by Allen *et al.* (9) averaged only 2.5 per cent less fat than the average for our Cornell women.

The Siri formula for body fat, using both density and total body water estimates, gave figures which averaged slightly higher than those derived by the Siri formula based on density only.

TOTAL BODY WATER; OXYGEN CONSUMPTION; CREATININE EXCRETION

Total body water figures using NAAP, basal oxygen consumption, and creatinine excretion appear in Table 2. The mean NAAP space was 30.33 ± 4.363 liters, which is equivalent to a 51.66 per cent body weight. The mean fat-free weight, calculated on the basis of the NAAP space, is 71.76 ± 9.099 per cent of the body weight.

Mean basal oxygen consumption was 198.55 ± 20.79 cc. per minute or 3.3855 cc. per minute per kilogram body weight. Creatinine excretion averaged 48.73 ± 7.823 mg. per hour. Expressed in terms of creatinine coefficient, the mean was 19.946 mg. per 24 hr. per kilogram body weight.

TABLE 2 Density, specific gravity, per cent body fat (calculated by various formulas), total body water (NAAP), basal oxygen consumption, and creatinine excretion

CHARACTERISTIC	RANGE	MEAN	STANDARD DEVIATION	MEDIAN
Density (gm./cc.)	1.0150– 1.0595	1.0342	0.0094	1.0343
Specific gravity				
(% body fat)	1.0217– 1.0665	1.0408	0.0094	1.0411
Rathbun-Pace (35)	15.81 – 38.62	28.69	4.856	28.55
Behnke (36)	15.62 – 36.51	27.13	4.508	27.00
Brozek-Keys (37)	15.21 – 32.59	24.92	3.691	24.81
Siri (25)				
Density only	17.20 – 37.68	28.66	4.362	28.51
Density body water	13.77 – 39.86	29.19	6.074	29.95
NAAP space				
Liters	23.0 – 44.0	30.33	4.363	29.65
% body weight	40.40 – 60.35	51.66	—	50.69
Basal oxygen consumption				
Cc./min.	152.5 –262.0	198.55	20.79	198.25
Cc./min./kg.	2.7536– 4.4994	3.3855	—	3.3359
Creatinine				
Excretion (mg./hr.)	29.3 – 67.5	48.73	7.823	47.5
Coefficient (mg./24 hr./kg.)	11.44 – 27.26	19.946	—	20.172
Fat-free weight				
Kg.	31.94 – 61.11	42.15	6.073	41.18
% body weight	56.10 – 96.33	71.76	9.099	70.41

SKINFOLD THICKNESSES; ANTHROPOMETRIC DATA

Means and standard deviations for skinfold thicknesses at each site, as well as the total and an "average," are expressed in millimeters in Table 3. The thickest pads were found on the lower trunk, especially on the abdomen midline half-way between the umbilicus and pubis (33.04 ± 10.43 mm.) The other major areas of fat deposit measured were the upper legs and upper arms: thigh, 32.99 ± 7.98 mm.; triceps, 25.43 ± 6.83 mm. Measurements made on Minnesota women in some of these locations (8) are slightly higher; contrary to what one might expect from specific gravity comparisons above, the figures are slightly higher than for Cornell women. However, the two groups of figures are not strictly comparable, since a caliper with only 5.4 gm. pressure per square millimeter jaw surface was used for the Minnesota women. Mean skinfold thickness for the Cornell women was 17.2 mm.; for the Minnesota group, based on slightly different measurements, 17.5 mm.

Means and standard deviations for "skeletal" and "envelope" (circumference) anthropometric measurements are given in Table 4. Proportionality constants for a "reference woman," as defined by Behnke *et al.* (23) based on the Cornell data, are presented for comparison with those of Behnke's "reference woman" and with data from other studies in the literature (Table 5). There is remarkable similarity among the data; note that the chest measurement used in our studies is not at the same location as that reported in the other studies.

CORRELATIONS

In Table 6 are presented the correlation coeffi-

TABLE 4 Skeletal and "envelope" (circumference) anthropometric measurements

SITE OF MEASUREMENT	MEAN	STANDARD DEVIATION
Skeletal Measurements		
	cm.	*cm.*
Ilio-cristal height	39.04*	4.472*
Sitting height	34.93*	1.213*
Bi-acromial width	37.24	1.735
Chest (xyphoid) width	25.38	2.888
Bi-iliac width	28.50	1.415
Bitrochanteric width	31.75	1.604
Knee to knee width	18.89	1.078
Knee width	8.71	0.3719
Ankle width	6.39	0.2654
Wrist width	5.02	0.2940
"Envelope" (Circumference) Measurements		
Trunk		
Shoulder	97.96	4.889
Deltoid diameter	39.50	1.952
Chest	73.41	4.566
Abdomen		
Hypochrondiac	68.29	4.912
Umbilicus	76.76	6.792
Hypogastric	89.64	5.278
Buttocks	97.36	4.636
Appendages		
Biceps	27.25	1.993
Upper arm	25.55	5.810
Forearm	24.87	1.351
Wrist	15.40	0.699
Knee	57.26	3.372
Thigh	37.59	2.060
Calf	35.55	1.995
Ankle	21.41	0.980

*Inches.

TABLE 3 Comparison of skinfold thickness of Cornell and Minnesota young women

SITE OF MEASUREMENT	SKINFOLD THICKNESS			
	Cornell women*		Minnesota women†	
	Mean	Standard deviation	Mean	Standard deviation
	mm.	*mm.*	*mm.*	*mm.*
Chin	7.06	2.25	8.7	2.14
Scapula	12.07	4.10	16.0	4.68
Chest				
Xyphoid level	8.67	3.53	—	—
Major pectoralis	6.64	2.75	15.7	4.21
Lower ribs	10.46	4.12	13.8	4.14
Waist	14.65	6.89	16.4	3.95
Abdomen				
Umbilicus	22.93	6.6	27.0	5.59
Half-way from umbilicus to pubis	33.04	10.43	—	—
Supra-iliac	20.74	8.55	—	—
Triceps	25.43	6.83	22.3	4.91
Thighs	32.99	7.98	38.8	9.68
Knee	11.37	3.80	15.5	3.53
Total	206.5	55.07		
"Average"	17.2		17.5	

*94 subjects; mean age, 20.36 yr.; caliper pressure, 10 gm./mm.²
†25 subjects; mean age, 24.4 yr.; caliper pressure, 5.4 gm./mm.²

cients for density with some of the other measurements. Total skinfold thicknesses showed the highest correlation, with a coefficient of –0.6866. (Significant at the 1 per cent level). Though there was essentially no correlation between absolute basal oxygen consumption and density, the correlation with basal oxygen consumption expressed per unit of body weight was highly significant, 0.6001. The correlation with percentage of standard weight was also very high, –0.5830, a better correlation than with actual weight, –0.4793. Actually the correlation of density with percentage of standard weight (based on average weights in *Build and Blood Pressure Study, 1959)* was considerably better than with either creatinine excretion or NAAP space measurement of body water.

Essentially no correlation existed between density and creatinine excretion or density and total body water (NAAP space) expressed as liters. However, a highly significant, though small, correlation existed between density and creatinine excretion expressed in terms of per kilogram body weight and NAAP space expressed as a percentage of body weight; the coefficients were 0.4062 and 0.3886, respectively. These are much lower than those of Miller and Blyth (26) for density and creatinine excretion in young men (0.826) or for density and basal oxygen consumption (0.924). However, in each case, there have been other work-

TABLE 6 Correlation coefficients

MEASURES CORRELATED	CORRELATION COEFFICIENT
Weight (kg.) with density	−0.4793**
Oxygen consumption with density	
Cc./min.	0.0806
Cc./min./kg.	0.6001**
Creatinine with density	
Excretion (mg./hr.)	0.0667
Coefficient (mg./24 hr./kg.)	0.4062**
NAAP space with density	
Liters	0.0007
% body weight	0.3886**
Standard weight (%) with density	−0.5830**
Total skinfold thicknesses (mm.) with density	−0.6866**
Oxygen consumption (cc./min.) with	
Creatinine (mg./hr.)	0.3274**
With NAAP space (liters)	0.4140**
Oxygen consumption (cc./min./kg.)	
With creatinine coefficient	0.3153**
With skinfold thickness	−0.5034**
With NAAP space (% body weight)	0.3172**
Creatinine excretion (mg./hr.) with NAAP space (liters)	0.2763**
Creatinine coefficient	
With NAAP space (% body weight)	0.2083*
With skinfold thickness	−0.3763**
Skinfold thickness	
With NAAP space (liters)	0.0540
With NAAP space (% body weight)	0.4091**
With standard weight (%)	0.7133**

*Significant at 5% level.
**Significant at 1% level.

TABLE 5 Proportionality constants (k values) of Behnke *et al.* (23) for reference woman based on Cornell data as contrasted with those from literature

MEASUREMENT OR DIMENSION	GROUPS REPORTED					
	WAF trainees (42)	USDA Women (43)	USDA Girls, age 17 (44)	Wil-loughby (45)	Behnke reference woman (23)	Cornell reference woman
N (number)	852	10,041	2771	20	—	94
Mean body radius—$\bar{R}$ (dm)*	1.042	1.073	1.027	1.045	1.047	1.060
Mean height—$\bar{h}$ (dm)†	16.27	16.05	16.11	16.27	16.38	16.75
Median weight—W (kg)	55.5	58.5	—	—	56.4	59.1
Mean weight—$\overline{W}$ (kg)	56.0	60.7	53.4	55.8	56.8	59.2
	k Values‡					
Circumferences (D)						
Shoulders	92.1	—	—	—	92.1	92.5
Chest#	78.8	—	—	—	78.8	69.2††
Upper arm¶	26.8	26.9	24.2	—	26.8	24.2
Biceps (flexed)	25.6	—	—	27.0	25.6	25.7
Forearm	23.1	23.1	—	23.1	23.1**	23.5
Buttocks	90.0	91.9	89.9	90.0	90.0	91.9
Thigh	53.3	52.6	52.1	52.7	52.6	54.1
Calf	32.7	31.8	32.4	32.5	32.5	33.6
Waist	64.5	69.0	62.9	63.0	—	64.4

*$\bar{R}$ in decimeters $= \sqrt{\frac{\overline{W}}{\pi\ \bar{h}}}$, where W represents median weight and h, mean stature.

†$\bar{h}$ (dm) = mean height or stature in decimeters.

‡k value = D (cm) ÷ $\bar{R}$, where D represents mean value for each dimension or circumference. Mean value for each dimension can be calculated from the products $k \times \bar{R}$.

#Chest, arm scye level and above mammary glands.

¶Axillary arm circumference.

**Arm flexed 90°, hand closed.

††Chest at xyphoid level.

ers who found relationships of a lower magnitude. In most cases, the correlation coefficients are much like those reported by Manniello (46) between similar measurements made in elderly men.

Correlation coefficients between various of the other measures are also given in Table 6. Again, note the large coefficient for the relationship between percentage of standard weight and skinfold thicknesses, 0.7133. Not only does skinfold thickness correlate as well with density as any measure used (–0.6866) but also with all the other measures as any one parameter (with oxygen consumption on a per-kilogram basis, –0.5034; with NAAP space as per cent of body weight, 0.4091; with creatinine coefficient, –0.3763). At least in the young group studied, in the absence of density measurements, simple skinfold determinations in well chosen spots would seem to indicate relative fatness better than the other more elaborate chemical procedures.

INTER-CORRELATIONS OF SKINFOLDS AND DENSITY

Table 7 gives the inter-correlations between skinfold measurements made at various sites and also that of each site with the total of skinfold thicknesses measured and with density. Obviously the best correlations with both total skinfold thicknesses and with density are for sites on the lower trunk, particularly the pelvic region. Measurement taken at a site on the abdominal midline mid-way between the umbilicus and the pubis (labelled "pubis" in Table 7) correlated best of all measurements with both total skinfold thickness (0.9020) and density (–0.6590). Correlations of other lower trunk positions (supra-iliac, umbilicus, and waist) are also high, but slightly less in each case. Of the upper trunk measurements, that over the lower ribs gave the best correlation with both total skinfold thickness (0.8883) and density (–0.6110). In general, measurements made on the appendages correlated better with each other than with either measurements made on the trunk or with density. Of the appendage measurements, that made over the triceps correlated better with total skinfold thickness and with density than that made on the thigh. These findings are in line with those of Garn based on soft tissue fat pads (13). For females, Garn found that iliac crest fat was the best single predictor of total body fat among the sites he measured (our best predictor on skinfold basis was not measured by soft tissue x-ray). For males, he showed that, in general, "central fat" (fat over the pelvis and lower trunk) had the highest correlations with weight; mid-trochanteric fat-pad was the best single predictor of fat (13, 22). The lower thoracic site was also good; it would be more or less equivalent to our lower rib measurement; on x-rays, waist, umbilicus, and pubis pads were not used.

From density and skinfold data, it is planned to formulate a regression equation for predicting density of young women on the basis of the more easily measured skinfolds. Data from soft tissue and joint x-rays have not yet been examined. Obviously, the surface has hardly been scratched on what can be derived from the data available.

Summary

Preliminary findings are reported on lean body mass and/or adiposity of ninety-four normal middle or upper middle class young women aged sixteen to thirty years. The mean age was 20.36 ± 1.951 years. The mean percentage of "average" weight (41) was 98.93 ±8.61, even though the women were in a fasting condition when weighed.

For such a group, density ranged from 1.0150 to 1.0595 gm. per milliliter with a mean 1.0342 ± 0.0094. Using the Rathbun and Pace formula based on specific gravity for the calculation of per cent body fat, the range was 15.81 to 38.62 per cent body fat; mean, 28.69 ± 4.856; median, 28.55.

Descriptive figures are also given for total body water (NAAP space); basal oxygen consumption, creatinine excretion, anthropometric and skinfold measurements.

TABLE 7 **Intercorrelations between skinfolds and with total skinfold thicknesses and with density**

SKINFOLD SITE	SCAPULA	CHEST		LOWER RIBS	WAIST	UMBILICUS	PUBIS	SUPRA-ILIAC	TRICEPS	THIGH	KNEE	TOTAL SKINFOLD	DENSITY
		Xyphoid	Major pectoralis										
Chin	.4180	.4827	.4380	.5760	.5216	.5310	.4931	.4576	.5111	.4045	.3707	.6003	−.4839
Scapula	—	.6548	.5636	.7224	.6549	.6693	.6266	.6756	.5902	.5073	.3304	.7667	−.5161
Chest													
Xyphoid		—	.5786	.8493	.7903	.7154	.7148	.7358	.6131	.5521	.3992	.8384	−.5615
Major pectoralis			—	.5974	.5751	.5515	.5730	.5820	.4648	.3741	.3158	.6580	−.3558
Lower ribs				—	.8346	.8100	.7609	.8010	.6234	.5380	.3749	.8883	−.6110
Waist					—	.7775	.8043	.8416	.6211	.5218	.3151	.8824	−.6042
Umbilicus						—	.8591	.7621	.6549	.5211	.2670	.8717	−.6049
Pubis							—	.7909	.7094	.5769	.2891	.9020	−.6590
Supra-iliac								—	.6347	.4971	.3153	.8681	−.6298
Triceps									—	.7639	.4373	.8176	−.5210
Thigh										—	.6344	.7462	−.4853
Knee											—	.4994	−.3772
Total skinfold												—	−.6866

Of all the measures used, body density was most highly correlated with skinfold thickness ($r = -0.6866$); next highest correlation was with basal oxygen consumption expressed on a per-kilogram basis ($r = 0.6001$). Density was more highly correlated with per cent of average weight than with either creatinine coefficient or total body water expressed as a percentage of body weight ($r = -0.5830$ vs. 0.4062 and 0.3886, respectively, though the latter coefficients are significant at the 1 per cent level.

Among skinfold measurements, the best correlation with "total" skinfold thickness and with density was for sites on the lower trunk, particularly the pelvic region. A measurement taken at a site on the abdominal midline, halfway between the umbilicus and the pubis, correlated best of all skinfold measurements with both "total" skinfold thickness ($r = 0.9020$) and density ($r = -0.6590$). Of the upper trunk measurements, that over the lower ribs gave the best correlation with both "total" skinfold thickness ($r = 0.8883$) and density ($r = -0.6110$). In general, measurements made on the appendages correlated better with each other than with either measurements made on the trunk or with density.

From density and skinfold data, it is planned to formulate regression equations for predicting density of young women on the basis of the more easily measured skinfold thicknesses.

References

(1) YOUNG, C. M.: Weight reduction using a moderate-fat diet. 1. Clinical responses and energy metabolism. 2. Biochemical responses. J. Am. Dietet. A. 28: 410, 529, 1952.

(2) YOUNG, C. M., RINGLER, I., AND GREER, B. J.: Reducing and post-reducing maintenance on the moderate-fat diet. Metabolic studies. J. Am. Dietet. A. 29: 890, 1953.

(3) YOUNG, C. M., EMPEY, E. L., SERRAON, V. U., AND PIERCE, Z. H.: Weight reduction in obese young men. Metabolic studies. J. Nutrition 61: 437, 1957.

(4) YOUNG, C. M., BROWN, A. M., EMPEY, E. L., AND TURK, D.: Stepwise weight reduction in obese young men: Nitrogen, calcium and phosphorus balances. J. Nutrition 64: 203, 1958.

(5) YOUNG, C. M., BROWN, A. M., GEHRING, B. A., AND MORRIS, B. M.: Stepwise weight reduction in obese young women: Clinical and metabolic responses. J. Nutrition 70: 391, 1960.

(6) YOUNG, C. M., GEHRING, B. A., MERRILL, S. H., AND KERR, M. E.: Metabolic responses of young women while reducing: Body fatness and nitrogen metabolism. J. Am. Dietet. A. 36: 447, 1960.

(7) CHEN, K. P.: Report on measurement of total body fat in American women estimated on the basis of specific gravity as an evaluation of individual fatness and leanness. J. Formosan Med. Assn. 52: 271, 1953.

(8) SKERLJ, B., BROZEK, J., AND HUNT, E. E., JR.: Subcutaneous fat and age changes in body build and body form in women. Am. J. Phys. Anthropol. 11: 577, 1953.

(9) ALLEN, T. H., PENG, M. T., CHEN, K. P., HUANG, T. F., CHANG, C., AND FANG, H. S.: Prediction of blood volume and adiposity in man from body weight and cube of height. Metabolism 5: 328, 1956.

(10) BEHNKE, A. R., JR., FEEN, B. G., AND WELHAM, W. C.: The specific gravity of healthy men; body weight ÷ volume as an index of obesity. J.A.M.A. 118: 495, 1942.

(11) BROZEK, J., HENSCHEL, A., AND KEYS, A.: Effect of submersion in water on the volume of residual air in man. J. Appl. Physiol. 2: 240, 1949.

(12) EDWARDS, D. A. W.: Observations on the distribution of subcutaneous fat. Clin. Sc. 9: 259, 1950.

(13) GARN, S. M.: Fat weight and fat placement in the female. Science 125: 1091, 1957.

(14) BROZEK, J., AND KEYS, A.: The evaluation of leanness-fatness in man: norms and interrelationships. Brit. J. Nutrition 5: 194, 1951.

(15) PASCALE, L. R., GROSSMAN, M. I., SLOANE, H. S., AND FRANKEL, T.: Correlations between thickness of skinfolds and body density in 88 soldiers. Human Biol. 28: 165, 1956.

(16) STUART, H. C., HILL, P., AND SHAW, C.: Studies from the Center for Research in Child Health and Development, School of Public Health, Harvard University. 3. The growth of bone, muscle and overlying tissues as revealed by studies of roentgenograms of the leg area. Monographs Soc. Res. Child Develop. Vol. 5, No. 3, Serial No. 26, 1940.

(17) GARN, S. M.: Relative fat patterning: An individual characteristic. Human Biol. 27: 75, 1955.

(18) GARN, S. M.: Roentgenogrammetric determinations of body composition. Human Biol. 29: 337, 1957.

(19) BROZEK, J., MORI, H., AND KEYS, A.: Estimation of total body fat from roentgenograms. Science 128: 901, 1958.

(20) GARN, S. M., AND GORMAN, E. L.: Comparison of pinch-caliper and teleroentgenogrammetric measurements of subcutaneous fat. Human Biol. 28: 407, 1956.

(21) BROZEK, J., AND MORI, H.: Some interrelations between somatic, roentgenographic and densitometric criteria of fatness. Human Biol. 30: 322, 1958.

(22) GARN, S. M.: An improved method of estimating body fat content by the use of teleoroentgenograms. Armed Services Tech. Information Agcy. Document No. A.D. 115-085, Air Force Off. Sci. Research TR-57-7, 1957.

(23) BEHNKE, A. R., GUTTENTAG, O. E., AND BRODSKY, C.: Quantification of body weight and configuration from anthropometric measurements. Human Biol. 31: 213, 1959.

(24) BEHNKE, A. R.: The estimation of lean body weight from "skeletal" measurements. Human Biol. 31: 295, 1959.

(25) BEHNKE, A. R.: Personal communication, 1958.

(26) MILLER, A. T., JR., AND BLYTH, C. S.: Estimation of lean body mass and body fat from basal oxygen consumption and creatinine excretion. J. Appl. Physiol. 5: 73, 1952.

(27) BEST, W. R., KUHL, W. J., JR., AND CONSOLAZIO, C. F.: Relation of creatinine coefficient to leanness-fatness in man. J. Lab. & Clin. Med. 42: 784, 1953.

(28) GARN, S. M., AND CLARK, L. C., JR.: Creatinine-weight coefficient as a measurement of obesity.

J. Appl. Physiol. 8: 135, 1955.
(29) RYAN, R. J., WILLIAMS, J. D., ANSELL, B. M., AND BERNSTEIN, L. M.: The relationship of body composition to oxygen consumption and creatinine excretion in healthy and wasted men. Metabolism 6: 365, 1957.
(30) BEHNKE, A. R.: The relation of lean body weight to metabolism and some consequent systematizations. Ann. New York Acad. Sc. 56: 1095, 1953.
(31) WELCH, B. E., RIENDEAU, R. P., CRISP, C. E., AND ISENSTEIN, R. S.: Relationship of maximal oxygen consumption to various components of body composition. J. Appl. Physiol. 12: 395, 1958.
(32) JOHNSTON, L. C., AND BERNSTEIN, L. M.: Body composition and oxygen consumption of overweight, normal and underweight women. J. Lab. & Clin. Med. 45: 109, 1955.
(33) VON DOBELN, W.: Human standard and maximal metabolic rate in relation to fat-free body mass. Acta physiol. scandinav. Supp. 126, Vol. 37: 1, 1956.
(34) COMM. ON NUTRITIONAL ANTHROPOMETRY, FOOD & NUTRITION BD.: Recommendations concerning body measurements for the characteristics of nutritional status. *In* Body Measurements and Human Nutrition. (J. Brozek, ed.). Detroit: Wayne Univ. Press, 1956.
(35) RATHBUN, E. N., AND PACE, N.: Studies on body composition. 1. The determination of total body fat by means of the body specific gravity. J. Biol. Chem. 158: 667, 1945.
(36) BEHNKE, A. R.: Body composition. I. *In vivo* estimation of fat and water content from specific gravity (density) determinations. *In* Methods for Evaluation of Nutritional Adequacy and Status. A Symposium. (Spector, H., Peterson, M. S., and Friedemann, T. E., eds.) Washington: Natl. Acad. of Sci.–Natl. Res. Council, 1954, p. 294.
(37) KEYS, A., AND BROZEK, J.: Body fat in adult man. Physiol. Rev. 33: 245, 1953.
(38) GARN, S. M.: Fat patterning and fat intercorrelations in the adult male. Human Biol. 26: 59, 1954.
(39) BRODIE, B. B.: Measurement of total body water. *In* Methods in Medical Research. Vol. IV. (Visscher, M. B., ed.) Chicago: Year Book Publishers, Inc., 1951, p. 31.
(40) HAWK, P. B., OSER, B. L., AND SUMMERSON, W. H.: Practical Physiological Chemistry. 12th ed. N. Y.: Blakiston Co., 1947.
(41) Build and Blood Pressure Study, 1959. Vol. I. Chicago: Society of Actuaries, 1959.
(42) DANIELS, G. S., MEYERS, H. C., JR., AND WORRALL, S. H.: Anthropometry of WAF basic trainees. Wright Air Development Center Tech. Report 53-12, 1953.
(43) O'BRIEN, R., AND SHELTON, W. C.: Women's Measurements for Garment and Pattern Construction. USDA Misc. Pub. 454, 1941.
(44) O'BRIEN, R., GIRSHICK, M. A., AND HUNT, E. P.: Body Measurements of American Boys and Girls for Garment and Pattern Construction. USDA Misc. Pub. 366, 1941.
(45) WILLOUGHBY, D. P.: An anthropometric method for arriving at the optimal proportions of the body in any adult individual. Research Quart. 3: 48, 1932.
(46) MANNIELLO, M. J.: Some studies on the gross body composition of sixty elderly men. Report on special problem for the Master of Nutritional Science, degree, Graduate School of Nutrition, Cornell University, 1961.

Pitfalls of Formula Diets

The Illinois State Medical Society's Committee on Nutrition recently issued a warning that, while formula diets may be accepted as food products, they should be used with caution, and that six considerations, in particular, should be kept in mind in avoiding reducing formula pitfalls.

(a) The special low-calorie formulas are dangerous for long-term use.

(b) They are not a substitute for a well balanced diet, except for short-term weight control programs, and are not a good means of saving money or time spent in eating.

(c) Additional vitamins should not be taken with the formulas, because many of them contain the daily recommended vitamin intake. Persons on 1800-calorie formulas should not, for the same reason, take two 900-calorie formula units, thus subjecting themselves to vitamin overdosage.

(d) A normal, healthy person should not expect to lose more than 1 or 2 lb. a week by dieting on medical advice in special situations. "Crash" diets should be shunned.

(e) Persons using formula products as their sole source of nutrition should consult their doctors immediately if constipation, diarrhea, or other symptoms develop.

(f) Any effective weight control program requires continuing adherence to a properly balanced diet. Once weight reduction is achieved, it should be maintained by balanced dieting — *from Chicago* Tribune, *December 27, 1960.*

Sodium and Potassium in Puerto Rican Meats and Fish[1]

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IN A PREVIOUS publication (1), the sodium and potassium content of about 180 foods and 78 public water supplies in Puerto Rico were reported. About 80 additional foods have been analyzed in duplicate for sodium and potassium, including native meat cuts, sea foods, and fresh-water fish frequently eaten in Puerto Rico.

Material and Methods

Fresh fish, seafoods, and meat cuts were obtained from local markets specializing in native meats and fish.

Samples were processed immediately after receipt by the nitric acid extraction procedure of Lowry and Hastings (2) to convert the electrolytes into a form suitable for introduction into the flame photometer. This procedure was preferred to the dry-ashing of the sample in the muffle furnace, because it was less time-consuming. Digestion of the samples with this procedure was so rapid and complete that it was found unnecessary to homogenize them before extraction.

Samples of about 5 gm. of the edible portion were weighed to a 250-ml. Erlenmeyer flask. Three ml. concentrated nitric acid were added to the sample, and the mixture was heated to the boiling point in a sand bath until digestion was completed. The digest was allowed to cool and transferred quantitatively to a 100-ml. volumetric flask. The digested mixture was neutralized with redistilled ammonium hydroxide to reduce corrosion of the atomizer and burner of the flame photometer. The contents of the flask were diluted to volume with triple-distilled water, mixed thoroughly, and filtered through dry acid-washed filter paper tested to be sodium and potassium free.

The filtrate was used to prepare appropriate dilutions for the flame photometric procedure. Usually 10-ml. aliquots of filtrate were diluted volumetrically to 100 ml. A second dilution was necessary in several samples containing high amounts of sodium or potassium.

Blank determinations were run through the whole extraction, filtration, dilution, and flame photometric procedures to insure that no contamination of glassware, filter paper, or triple-distilled water had occurred.

Sodium and potassium standards were run with the samples and the blank. The stock standard contained 140 mEq sodium and 4 mEq potassium per liter. Standard dilutions were prepared to give readings matching closely the readings of the sample dilutions.

All glassware used was acid-washed and rinsed with triple-distilled water.

Determinations were performed by the flame photometric method as described by Clifford *et al* (3). A Patwin FC flame photometer was used.

Results and Discussion

Sodium and potassium values obtained for the native meats and fish are recorded in Table 1. Also in-

[1]Received for publication October 3, 1960.

[2]The author wishes to acknowledge the cooperation given by Berta Cabanillas de Rodríguez, Associate Professor of the Home Economics Department, University of Puerto Rico, who verified the translations from Spanish to English of the common names of the fish and meats analyzed; Paquita Haddock de Agosto, Training Dietitian of the San Patricio VA Hospital; Ada Montalvo de Irizarry, Research Dietitian, General Medical Research Laboratory, who cooperated by providing the lists of meats and fish to be analyzed and by stimulating the author to complete the study; and Dr. R. Rodriguez-Molina, Assistant Director, Professional Services for Research and Education, San Patricio VA Hospital, for his encouragement during this study.

TABLE 1 **Sodium and potassium in Puerto Rican meats and fish**

FOOD		SODIUM		POTASSIUM	
English name	Spanish name	Range	Mean	Range	Mean
		mg./100 gm.	*mg./100 gm.*	*mg./100 gm.*	*mg./100 gm.*
Beef, native	*res del pais*				
Shank	*garrón*	71– 73	72	420–436	427
Hind quarter	*pernil trasero*	68– 72	70		
Round	*tabilla*	30– 48	39	350–376	363
Eye of the round	*lechón o gansillo*	38– 61	50	416–423	420
Loin	*tamillo*	55– 61	58	350–358	354
Tenderloin	*filete*	52– 54	53	328–356	342
Chuck	*espalda*	58– 63	61	320–326	323
Rump	*cadera*	64– 74	69	300–347	323
Flank	*faldilla*	51– 54	53	275–308	292
Brisket	*pecho*	81– 85	83	133–137	135
Heart	*corazón*	50– 83	67	211–235	226
Liver	*hígado*	53– 60	57	197–216	206
Tongue	*lengua*	35– 38	37	71– 76	73
Kidney	*riñón*	170– 268	219	222–240	231
Mixture of lung, kidney, liver, heart	*gandinga*	100– 108	104	143–177	160
Splint	*pancreas*	61– 77	69	359–369	364
Honeycomb tripe	*mondongo*	44– 45	44	26– 32	29
Ground meat	*molida*	31– 37	34	298–314	306
Brains	*sesos*	70– 100	85	228–286	257
Turkey, native	*pavo del pais*				
Breast	*pechuga*	69– 70	70	320	320
Drumstick	*muslo*	98– 102	100	246–277	262
Liver	*hígado*	94– 107	100	176–187	182
Gizzard	*molleja*	56– 102	79	232–320	276
Heart	*corazón*	81– 84	82	243–271	257
Goat, tender, native	*cabrito del pais*	94	94	380	380
Pork, native	*cerdo del pais*				
Ham, fresh	*pernil*	49– 55	52	234–300	267
Round	*masa*	58– 61	60	250–254	252
Kidney	*riñón*	95– 106	101	186–202	194
Chops	*chuleta*	36– 71	54	276–291	284
Pigsfeet, (knuckles) fresh	*patitas, frescas*	51– 73	62	274	274
Heart	*corazón*	51– 66	59	251–257	254
Spare ribs	*costillas*	23– 46	35	153–267	210
Brains	*sesos*	70– 100	85	228–286	257
Liver	*hígado*	66– 68	67	300–320	310
Stomach	*"cuajo"*	39– 64	52	145–209	177
Intestine	*cuchiflito*	41– 58	50	152–186	169
Cured meats	*carnes curadas*				
Beef, dried	*cecina*	4,491– 7,250	5,870	381–380	381
Ham	*jamon*				
Smoked	*ahumado*	1,006– 2,811	1,909	142–162	142
Cooked	*hervido*	714– 1,278	996	254	254
Pigsfeet (knuckles)	*patitas de cerdo*	2,515–10,340	6,427	52	52
Sausages	*embutidos y mezclas de carnes*				
Pork	*longaniza*	779– 1,178	979	252–276	265
Farmer's	*salchichón*	1,770– 2,118	1,939	356	356
Mortadella	*mortadella*	2,063– 2,516	2,290	356	356
Pork link	*butifarra*	821– 943	882	334–338	336
Vienna	*salchichas*	809– 819	810	154–167	160
Frankfurter	*salchichas de Frankfurt*	1,048– 1,065	1,050	208	208
Spanish	*sobreasada*	559– 894	727	198–244	221
Spam	*Spam*	1,180– 1,288	1,234	222	222
Cured fish, salted	*pescado salado*				
Codfish	*bacalao*	6,521– 8,333	7,427	304–445	375
Canned	*enlatado*	460– 490	475	247–253	250
Flaked	*deflecado*	569– 608	589	153–179	166
Herring	*arenque*	2,973– 4,472	3,723	202–300	251
Veal, native	*ternera del pais*				
Round	*masa*	62– 64	63	322–328	325
Chops	*chuleta*	36– 57	47	276–280	278
Legs	*pernil*	44– 54	49	296–313	304
Liver	*hígado*	66– 72	69	213–240	226
Chicken, native	*pollo del pais*				
Breast	*pechuga*	41– 59	50	236–252	244
Drumstick	*muslo*	42– 58	50	226–244	235
Liver	*hígado*	43– 60	51	187–222	204
Wings	*alas*	77– 93	85	236–237	236
Heart	*corazón*	52– 58	55	233–280	257
Gizzard	*molleja*	86– 88	87	256–266	260
Neck	*pescuezo*	51– 72	62	219–231	225
Legs	*patas*	89– 116	103	91–110	100

TABLE, 1. Concluded

FOOD		SODIUM		POTASSIUM	
English name	Spanish name	Range	Mean	Range	Mean
		mg./100 gm.	*mg./100 gm.*	*mg./100 gm.*	*mg./100 gm.*
Shellfish	*marisco con concha*				
Shrimp	*camarones*				
Fresh water	*del río, frescos*	39– 52	45	118–119	118
Salt water	*del mar, frescos*	84	84	140–141	140
Land crab, native	*jueyes, frescos*	92– 99	95	107–115	111
Turtle meat (carey)	*carey*	58– 100	79	242–360	301
Lobster	*langosta*				
Fresh	*fresca*	196– 205	200	337–420	379
Frozen	*congelada*	161– 215	188	210–277	244
Oysters, fresh	*ostras, frescas*	612– 624	618	83– 96	90
Fish, native	*pescado del país*				
Red gold fish	*salmonete*	44– 82	63	297–409	351
Spanish mackerel	*sierra*	28– 32	30	135–137	136
Red grouper	*mero*	73– 96	80	140–298	233
Barracuda	*picúa*	43– 49	46	146–164	155
(Red) snapper	*pargo*	107– 192	150	218–240	229
Yellow tail	*colirubia*	36– 42	39	145–168	157
Hog fish	*capitán*	48– 52	50	400–444	422
Lane snapper	*manchego*	29– 37	33	119–131	125
Yellow grunt	*boquicolorao*	62– 83	72	253–267	260

cluded are the common names of the meats and fish in Spanish and English. The results are expressed in terms of milligrams sodium or potassium per 100 gm. food. Minimum, maximum, and average values are presented.

The fresh meats and fish contained from 50 to 100 mg. sodium per 100 gm. edible portion. Exceptions on the high side were beef kidney, chicken legs, lobster, oysters, and (red) snapper fish; and on the low side were beef round, eye of the round, ground beef, pork chops, spare ribs, veal chops, yellow tail fish, and lane snapper fish.

The processed meats and fish contained larger amounts of sodium than the fresh products. Heavy salting is evident in such items as dried beef, ham, pigs feet (knuckles), sausages, codfish, and herrings.

A difference was obtained in the fresh water shrimp (45 mg. sodium per 100 gm.) and salt water shrimp (84 mg. sodium per 100 gm.).

The average values for all fresh samples analyzed ranged from 30 mg. sodium per 100 gm. for the Spanish mackerel to 618 mg. sodium per 100 gm. for fresh oysters.

The values for potassium varied less than the sodium values. Very low exceptions were beef honeycomb tripe (29 mg. per 100 gm.) and pigs feet (knuckles) 52 mg. per 100 gm.).

Summary

Sodium and potassium determinations on about eighty native fish and meats frequently consumed in Puerto Rico are presented.

References

(1) CANCIO, M., AND LEON, J. M.: Sodium and potassium in Puerto Rican foods and waters. J. Am. Dietet. A. 35: 1165, 1959.

(2) LOWRY, O. H., AND HASTINGS, A. B.: Histochemical changes associated with aging. 1. Methods and calculations. J. Biol. Chem. 143: 257, 1942.

(3) CLIFFORD, P. A., AND WINKLER, W. O.: Report on the determination of sodium in foods. Gravimetric and flame photometric methods. J. Assn. Off. Agric. Chem. 37: 586, 1954.

Mortality Rates in the United States

Since 1900, the mortality rate in this country has dropped by 45 per cent—from 17.2 per 1000 population to 9.4. Also, the differential between nonwhites and whites has narrowed. In 1900, this amounted to 47 per cent in favor of the white population, but by 1959, the rates were 9.9 per 1000 white persons, compared with 9.4 per nonwhites.

Women have benefited more than men, the drop for women being from 16.5 per 1000 population in 1900 to 8.0 in 1959, a decline of 50 per cent. For males, the corresponding drop was from 17.9 to 10.9, or 31.9 per cent.

The largest relative gains, however, occurred at the younger ages. The mortality rate dropped by 82 per cent during infancy and by 94 per cent at ages one to four. Comparable declines at other age groups were: ages five to nine, 89 per cent; ages thirty-five to forty-four, 72 per cent; ages sixty-five to seventy-four, 28 per cent; ages eighty-five and over, 21 per cent.

One of the main reasons for the decline in mortality rates, according to the Health Information Foundation, has been the control of major communicable diseases. During the last six decades, the death rate for influenza and pneumonia has dropped by 86 per cent and for tuberculosis by 97 per cent.

Minerals and Proximate Composition of Organ Meats[1]

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INFORMATION ON THE mineral content of animal tissue, particularly organ meats, is of increasing concern to dietitians for planning controlled diets and to food technologists involved in problems of food quality.

This paper presents data obtained from an exploratory study of several minerals found in tissue of organs which have important functions in the pathways of mineral metabolism (1). Results were obtained using the techniques of emission spectroscopy. In addition, data on proximate composition were obtained on the same sample, making it possible to relate the mineral content to nutrients such as protein.

Experimental Procedure

COLLECTION AND PREPARATION OF SAMPLES

Organs of beef, chicken, lamb, pork, and veal were collected in retail-sized lots, replicated two to four times, from a large meat packing establishment in Baltimore, Maryland. Fresh weight of each sample was recorded as it was received in the laboratory. Adhering fat and connective tissue were removed from each sample, simulating home preparation and cleaning procedures as closely as possible. Weight of waste was recorded, and the edible yields calculated for each organ on a raw weight basis. To minimize contamination, stainless steel knives were used for dicing, and chemically clean containers for handling, grinding, and storing.

Organs were cut into small pieces and then ground in a large stainless steel blender until the entire edible portion of the sample was fully blended. To obtain representative values and eliminate variation in mineral content between different parts of a given organ, the entire sample was blended and subsamples taken for analysis. One portion of the blend was removed for determination in the fresh state of total moisture, fat, ash, and nitrogen. Another portion was placed on enameled trays and dried under heat lamps according to the method of Hewston *et al.* (2). With very few exceptions, samples were prepared and partially dried under the heat lamps on the same day they were received in the laboratory.

The dried sample was ground in a Wiley mill fitted with a 20-mesh stainless steel screen, thoroughly mixed, and stored under refrigeration in 1-oz., brown glass bottles. For foods high in lipids, such as brains, pancreas, whole egg, and egg yolk, it was necessary to remove part of the fat from the dry sample prior to grinding. This was done by carefully washing the entire dried sample with petroleum ether. Residual moisture determinations were made on all samples, and residual lipids on all petroleum ether-washed samples.

ANALYTICAL SYSTEM FOR MINERALS

Up to 10 mg. of the dried ground sample were weighed into purified carbon electrodes, which were then placed in a muffle furnace equipped with a quartz liner and ashed therein at a temperature of 500°C. over a 90-min. period. Arcings of each sample were made at random on photographic plates on four different days as a means of increasing the accuracy of the spectrographic determinations (3). A medium quartz spectrograph was employed with a motor generator providing an excitation current of 20 amperes. Nine elements determined simultaneously, as previously described (4), were in the order read from photographic plates: boron, phosphorus, magnesium, manganese, iron, aluminum, calcium, copper, and sodium. Potassium was determined by

[1]Received for publication August 11, 1960.
[2]Grateful acknowledgement is made to the following persons who assisted in the chemical analyses: Susie Hagan, Anne Marsh, Daisy Russell, and Cora Weeks.

flame photometry using a Beckman DU spectrophotometer.

PROXIMATE COMPOSITION PROCEDURES

Samples for moisture determination were weighed in shallow 60-mm. aluminum foil moisture dishes and dried overnight at 50°C. in a forced-air oven. Drying was continued to constant weight in a vacuum oven at 50°C. for approximately 48 hr. Weight loss was recorded as the moisture content. Residual moisture in the infrared-dried, ground samples was determined similarly, omitting the first drying in the forced-air oven.

Fat (ether extract) in eggs was determined on the fresh sample by acid hydrolysis (5), followed by a wash of the ether layer with dilute ammonium hydroxide to remove ether-soluble non-lipid derivatives of protein and carbohydrate. Ether extract in all other samples was determined by overnight continuous extraction of the dried moisture samples in a Soxhlet apparatus using petroleum ether as the solvent. Residual lipid in the dried, solvent-washed samples was also determined by overnight Soxhlet extraction, using the dried residual moisture samples and extracting with petroleum ether.

The micro-Kjeldahl method of the Association of Official Agricultural Chemists (5) was employed for determining total nitrogen. The method was modified by using .02 N hydrochloric acid rather than boric acid as the receiving solution, and titrating with .02 N sodium hydroxide, using methyl red as indicator. Values for protein were obtained by multiplying the total nitrogen content by 6.25, the factor indicated by Jones (6) to be applicable to meat and eggs. Samples for total ash, after overnight drying at 50°C. in a forced-air oven, were ashed to constant weight at 600°C.

Results and Discussion

Results of analyses for mineral elements are reported as milligrams of the mineral per 100 gm. fresh weight (Table 1) and milligrams per 100 gm. protein (Table 2). Mineral elements are listed in the tables in the order in which they were read on the photographic plate. Boron was detected only in chicken gizzard, chicken liver, and veal liver. Aluminum in all organs was present in amounts below the lower limit of detectability for the sample size used. Proximate composition values, as percentages of edible portions, are recorded in Table 1.

MINERAL CONTENT OF ANIMAL ORGANS

Boron content[3] was highest in chicken gizzard, chicken liver, and veal liver, averaging 0.04 mg. per 100 gm. in each organ. As pointed out above, boron was not detected in any of the other organs.

Phosphorus content of lamb liver, pork liver, brain, beef pancreas, and egg yolk was uniformly high, averaging around 300 mg. per 100 gm. (Figure 1 and Table 1). Egg white, by far the lowest in phosphorus, contained only about 2 per cent as much total phosphorus as egg yolk, and 4 per cent as much total phosphorus as brain or pancreas.

Magnesium in all animal organs ranged over the relatively narrow limits of 10 to 20 mg. per 100 gm.

Manganese was detectable only in liver, kidney, egg yolk, pork pancreas, and chicken gizzard. Samples wherein manganese was below the detectable limits of the medium spectrograph were estimated to contain less than 0.07 mg. manganese per 100 gm. fresh weight. In general, manganese content of all livers varied within narrow limits, averaging 0.25 mg. per 100 gm. Bovine pancreas contained considerably less total manganese than swine pancreas. The former animal is a ruminant, the latter a non-ruminant.

Iron content of livers from swine and chicken, (non-ruminants) was appreciably greater than that of livers from ruminants (Figure 1). Total iron content of heart and kidney ranged between 2 and 5 mg. per 100 gm. fresh weight. Iron content of pork liver was highest among the organs studied. Conceivably, the iron content of successive lots of pork liver from different sources may vary over wide limits, depending on supplemental feeding practices, or other variables (7). The iron of egg whites was only 10 per cent of the levels observed in egg yolks.

Calcium content ranged over relatively narrow limits in all samples, 6 to 14 mg. per 100 gm., except for egg and its parts. The high total calcium of egg yolk was coincidental with a high fat (ether extract) level (Table 1). Total calcium of egg yolk was ten times that of other animal tissues studied, and, except for brain and pancreas, lipid content of egg yolk was about ten times that of the other tissues. In general, total calcium in hearts was lower than that in brain, liver, or kidney, ranging lower than 6 mg. per 100 gm. fresh weight. In this regard, heart muscle resembled skeletal muscle, particularly that of beef muscle (8).

Copper content of lamb liver was highest of all animal livers. Pork and chicken livers contained the lowest total copper (Table 1 and Figure 1). Copper in lamb liver was about fivefold that of beef liver, and ten times that of the non-ruminants, swine and chicken. The lamb liver has long been known to be the main site of copper storage (9). Of interest was the finding that the total copper content of lamb liver, ranging from 3.7 to 6.3 mg. per 100 gm. fresh weight, exceeded limits for copper in "foods"—2.0 mg. per 100 gm.—recommended by the Food Standards Committee of Scotland (10).

Sodium content of brain and kidney was appreciably higher than that of other organs (Figure 1).

[3]Not included in Table 1.

Egg white contained about five times the sodium of egg yolk and approached kidney and brain in concentration. Egg yolk and pork pancreas contained the lowest amount of sodium. Sodium values for beef and lamb kidney were in good agreement with those published by the Food and Nutrition Board (11).

Potassium was highest in pancreas, gizzard, tongue, and beef liver, ranging from 214 to 303 mg. per 100 gm. fresh weight and three to five times the corresponding content of sodium. Lowest potassium content was found in egg yolk, where the concentration was similar to that for sodium.

PROXIMATE COMPOSITION

Moisture values for brain, gizzard, heart, and kidney were similar, ranging from 75 to 80 per cent, (Table 1). Liver moistures were lower, centering around 68 per cent except for chicken liver which averaged 72 per cent. Lowest moisture levels, 50 per cent, occurred in egg yolk.

Protein values were highest in liver, averaging about 20 per cent, followed by beef heart. Lowest protein values were found in egg white, which was also highest in moisture, and in brain.

Highest fat (ether extract) levels, around 25 per

TABLE 1 Proximate composition and mineral content of the edible portion of raw organ meats, including chicken eggs

SAMPLE	YIELD OF EDIBLE PORTION	PROXIMATE COMPOSITION				MINERAL CONTENT							
		Moisture	Protein	Fat (ether extract)	Ash	P	Mg	Mn	Fe	Ca	Cu	Na	K
		%				mg./100 gm. fresh weight							
Brain													
Beef	98	79.4	10.4	8.0	1.32	265	12	*	1.2	11	0.20	104	191
	98	77.1	10.7	10.0	1.42	274	14	*	1.6	9	0.19	105	171
Pork	99	77.7	11.1	9.4	1.40	300	11	*	1.4	7	0.30	98	196
	97	78.2	10.4	9.5	1.37	295	15	*	1.2	12	0.18	132	167
Veal	97	79.4	10.2	8.3	1.42	249	14	*	0.8	11	0.14	133	204
Eggs													
Whole	87	74.2	12.5	9.2	0.95	146	10	*	2.1	55	0.06	101	105
	88	75.4	12.7	8.2	0.88	97	12	*	2.7	56	0.05	92	123
Whites	—†	87.8	10.4	<0.1	0.72	11	5	*	<0.5	3	0.03	122	144
	63	87.2	10.9	<0.1	0.72	12	8	*	<0.5	5	0.02	121	123
Yolks	—	52.2	16.1	24.5	1.63	390	13	0.10	4.7	129	0.12	38	52
	26	48.5	16.2	27.1	1.72	492	14	0.12	6.4	139	0.13	30	46
Gizzard, chicken	99	78.4	18.3	0.4	0.82	113	13	0.11	2.7	8	0.08	64	253
	98	79.2	17.8	0.5	0.85	95	12	0.10	3.1	13	0.07	66	226
Heart													
Beef	60	76.6	18.2	2.2	1.16	141	19	*	3.3	7	0.27	66	161
	79	76.5	18.4	2.4	1.06	172	18	*	3.6	<6	0.26	81	212
	75	77.6	17.8	2.4	1.04	173	20	*	4.5	<6	0.29	100	218
	80	78.3	16.8	2.5	0.99	152	17	*	3.4	<6	0.30	91	213
Chicken	99	75.2	13.8	9.2	0.92	162	14	*	3.4	<7	0.23	72	168
	90	78.4	14.7	4.9	0.94	145	14	*	3.2	<6	0.22	73	146
	93	76.9	15.0	6.3	1.04	182	18	*	3.3	6	0.22	92	162
Pork	90	78.6	16.6	4.0	0.77	146	15	*	3.3	<6	0.37	58	108
	84	80.0	16.0	2.1	0.59	110	10	*	3.1	<6	0.20	51	105
Veal	72	77.6	16.1	2.9	1.03	170	18	*	2.2	7	0.34	94	191
	74	78.9	17.0	1.2	1.06	150	16	*	3.7	6	0.28	94	226
Kidney													
Beef	89	79.9	15.5	1.9	1.12	150	11	0.08	5.4	9	0.35	161	175
	81	79.4	16.2	1.5	1.17	199	14	0.08	4.4	9	0.34	145	197
	89	80.1	15.4	1.7	1.10	194	13	0.07	4.3	11	0.28	155	196
Lamb	98	78.6	16.2	2.0	1.26	181	13	0.09	2.9	12	0.32	151	205
Pork	93	79.3	16.1	1.7	1.16	187	18	0.12	4.8	10	0.51	129	172
	93	78.8	16.3	1.7	1.01	192	16	0.10	5.0	12	0.38	101	184
Liver													
Beef	90	68.1	20.4	2.5	1.50	167	15	0.27	4.7	14	1.2	43	214
	96	68.6	20.5	1.5	1.32	261	13	0.25	8.3	12	1.2	63	236
	97	67.5	20.4	1.6	1.38	250	12	0.22	3.0	13	2.2	50	253
Chicken	100	71.4	18.2	2.3	1.29	195	13	0.18	9.0	11	0.32	60	179
	99	72.5	19.0	1.4	1.29	272	20	0.26	10.0	10	0.28	69	166
Lamb	94	67.7	21.8	4.2	1.55	365	14	0.23	2.6	13	3.7	51	170
	96	67.8	20.8	2.2	1.38	304	13	0.20	5.7	10	6.3	53	233
Pork	96	68.4	22.4	2.3	1.51	313	15	0.28	26.0	13	0.46	71	249
	99	69.9	22.0	2.5	1.35	316	18	0.37	31.0	11	0.56	72	185
Veal	97	69.5	19.9	2.2	1.51	282	18	0.26	3.6	13	1.7	54	238
	98	69.2	20.3	4.1	1.34	245	15	0.23	5.0	14	2.2	52	226
Pancreas													
Beef	94	70.6	14.6	12.3	1.51	335	15	*	1.0	9	0.06	62	249
	97	72.5	14.8	10.4	1.55	319	20	*	1.4	8	0.06	72	303
Pork	100	70.1	15.2	12.0	1.07	234	17	0.14	1.0	11	0.09	31	194
Tongue—beef, fresh	76	68.6	16.3	13.4	0.87	122	16	*	2.0	6	0.07	86	247
	79	68.1	15.4	14.9	0.94	115	15	*	1.5	<6	0.07	76	245

*Not detected.

†Not obtained.

cent, were found in egg yolk, ranging to twofold that found in any of the other foods. Brain, pancreas, and tongue had ether extract levels of between 8 and 15 per cent. Fat (ether extract) content of all other organs, including pork liver, was 4 per cent or less.

Total ash was highest in egg yolk and beef pancreas, 1.5 to 1.7 per cent. Lowest total ash was found in pork heart and egg white. In general, variation of ash content of any single organ between different species was negligible compared with variation between different organs within a species.

Edible yields for pancreas and veal brain averaged 97 per cent; for beef brain, pork brain, and chicken gizzard, 98 per cent (Table 1). Edible yields for all other organs were in close agreement with values reported previously in the USDA Handbook 102 (12).

ELEMENT CONTENT EXPRESSED ON PROTEIN BASIS

On a fresh weight basis, milligrams of each element per 100 gm. protein are presented in Table 2. By dividing these values by 16, the milligrams of element per gram of nitrogen may be obtained.

Phosphorus content of brain, beef pancreas, and egg yolk ranged highest from 1540 to 2770 mg. per 100 gm. protein. This average was more than twice that calculated for bovine muscle (8).

Magnesium content of most organs was below 105 mg. per 100 gm. protein, except for brain, pancreas, chicken heart, and pork kidney.

Manganese content per 100 gm. protein was highest in liver, ranging from 1.01 in lamb to 1.47 in pork liver.

Iron levels were highest in liver, egg yolk, heart, and kidney, when expressed in terms of the protein content. Pork liver contained an average of 128 mg. iron and chicken liver 51 mg. iron per 100 gm. protein. Beef and pork pancreas were lowest in iron content on a protein basis.

The low calcium content of animal heart noted earlier became more evident when expressed on a per-100-gm. protein basis. On the other hand, the high calcium content in egg yolk was accentuated, reaching the value of 830 mg. per 100 gm. protein, and more than tenfold that in most organ meats.

Copper in lamb liver, when expressed on the basis of 100 gm. protein, again ranked highest among the organ meats, being 24 mg. per 100 gm. protein. Chicken and pork livers remained lowest among the animal livers, being 1.65 and 2.30 mg. per 100 gm. protein, respectively. Egg white contained only one-third as much copper as egg yolk—0.25 mg. copper per 100 gm. protein—making it the lowest of all the foods analyzed.

Sodium in brain, kidney, and egg white ranged between 700 and 1300 mg. per 100 gm. protein, greatly exceeding the value of 190 mg. sodium per 100 gm. protein in bovine muscle (8). The lowest values occurred in pork pancreas and egg yolk, being 204 and 211 mg. per 100 gm. protein, respectively.

Potassium content of brain and beef pancreas per 100 gm. protein was highest among the entire group

TABLE 2 **Mineral content of the edible portion of raw organ meats**

SAMPLE	NUMBER OF LOTS	MINERAL CONTENT IN THE EDIBLE PORTION								MINERAL RATIOS				
		P	Mg	Mn	Fe	Ca	Cu	Na	K	Ca:P	Ca:Mg	Na:K	Fe:Cu	Cu:Mn
		mg./100 gm. protein												
Brain														
Beef	2	2554	123.0	*	13.2	95.0	1.85	991	1717	0.04	0.8	0.6	7.2	—†
Pork	2	2770	122.0	*	12.0	89.2	2.20	1076	1686	0.03	0.7	0.6	5.4	—
Veal	1	2441	137.0	*	7.8	108.0	1.40	1304	2000	0.04	0.8	0.7	5.7	—
Eggs														
Whole	2	966	87.2	*	19.0	440.0	0.45	766	904	0.5	5.0	0.8	44.0	—
Whites	2	108	60.7	*	<4.7	37.4	0.25	1142	1256	0.3	0.6	0.9	<20.0	—
Yolks	2	2730	83.6	0.68	34.4	830.0	0.75	211	304	0.3	9.9	0.7	44.0	1.1
Gizzard, chicken	2	576	69.2	0.58	16.1	58.4	0.40	360	1326	0.1	0.8	0.3	39.0	0.7
Heart														
Beef	4	897	104.0	*	20.8	<35.0	1.58	477	1132	<0.04	<0.3	0.4	13.0	—
Chicken	3	1124	106.0	*	22.8	<44.0	1.59	544	1097	<0.04	<0.4	0.5	15.0	—
Pork	2	784	76.4	*	19.6	<37.0	1.70	334	653	<0.05	<0.5	0.5	11.0	—
Veal	2	969	103.0	*	17.8	<39.0	1.85	568	1258	0.04	0.4	0.5	9.5	—
Kidney														
Beef	3	1152	80.6	0.49	30.0	61.7	2.07	980	1206	0.05	0.8	0.8	14.0	4.2
Lamb	1	1117	80.2	0.56	17.9	74.1	2.00	932	1265	0.07	0.9	0.7	9.1	3.6
Pork	2	1170	105.0	0.68	30.2	67.8	2.75	710	1099	0.06	0.6	0.6	11.0	4.0
Liver														
Beef	3	1106	65.2	1.21	26.1	63.6	7.53	254	1147	0.06	1.0	0.2	3.5	6.2
Chicken	2	1252	88.4	1.18	51.0	56.5	1.65	346	929	0.04	0.6	0.4	32.0	1.4
Lamb	2	1568	63.4	1.01	19.6	53.8	23.6	244	950	0.03	0.9	0.3	0.8	23.0
Pork	2	1417	74.4	1.47	128.0	54.0	2.30	322	976	0.04	0.7	0.3	56.0	1.6
Veal	2	1312	82.2	1.22	21.4	67.2	9.65	264	1155	0.05	0.8	0.2	2.2	8.0
Pancreas														
Beef	2	2225	119.0	*	8.2	57.8	0.40	456	1876	0.03	0.5	0.2	20.0	—
Pork	1	1540	112.0	0.92	6.6	72.4	0.60	204	1276	0.05	0.6	0.2	11.0	0.6
Tongue—beef, fresh	2	748	97.8	*	11.0	<38.0	0.45	511	1553	<0.05	<0.4	0.3	25.0	—

*Not detected. †Not obtained.

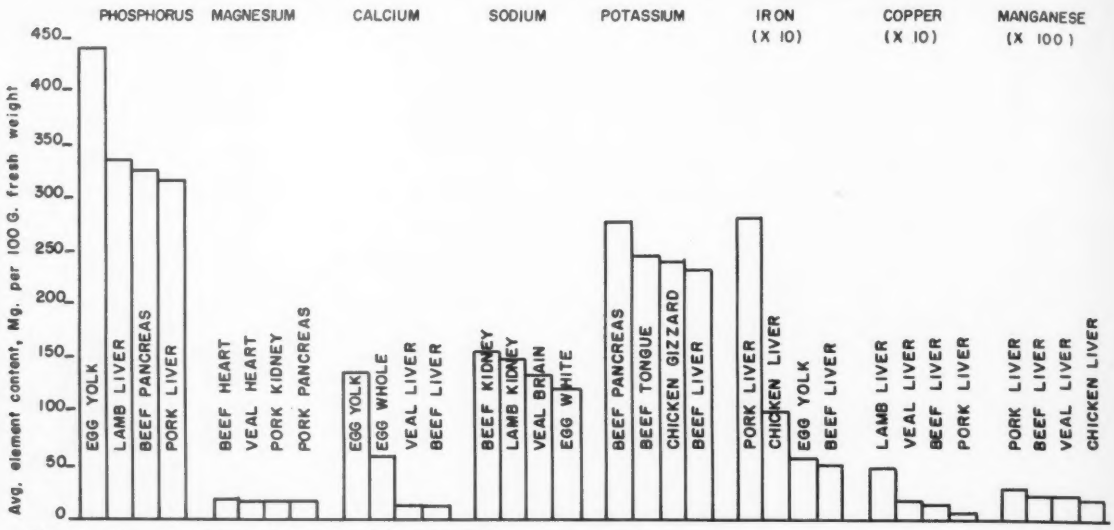

FIG. 1. *Mineral content of the four highest ranking organ meats.*

of organs, ranging from about 1700 to 2000 mg. potassium.

RATIOS FOR PAIRS OF MINERAL ELEMENTS

Element pairs of general interest in animal and human nutrition are calcium-phosphorus; calcium-magnesium; sodium-potassium; iron-copper; and copper-manganese. The ratios for these element pairs shown in Table 1 are useful in studying basic differences among different organ meats.

Calcium-phosphorus ratios in no case approached 1 to 1. Chicken egg and gizzard together averaged about 0.3 to 1. For other organs, the ratio was about 0.05 to 1.

The calcium-magnesium ratio approached 1 to 1 in brain, kidney, liver, and chicken gizzard. In whole egg, the ratio was about 5 to 1; in egg yolk, 10 to 1.

Sodium-potassium ratio approached 1 to 1 in chicken egg and beef kidney. For other organs, the ratio varied within narrow limits in the neighborhood of 0.6 to 1, or less.

Unlike the foregoing ratios, those for iron-copper in liver tended to vary over wide limits. For example, the iron-copper ratios for pork and chicken liver were 56 and 32 to 1, respectively. For lamb liver, the ratio was 0.8 to 1. Ratios for most other organs were the order of 10 to 1.

Copper-manganese ratios also varied widely in liver, being 23 to 1 in lamb liver and 1.4 to 1 in chicken liver.

Summary

Content of ten minerals and the proximate composition are reported in eight animal organs from several domestic animal species obtained from a meat packing establishment in Baltimore, Maryland. Mineral content of all organs was computed on both the fresh weight and a protein content basis, and selected mineral ratios of interest to nutritionists were reported.

Iron content of the livers of swine and chicken—non-ruminants—was more than twice that of livers from ruminants. By far the highest iron values were found in pork liver, ranging from 26 to 31 mg. per 100 gm. fresh weight.

Copper content of lamb liver was about three times that of beef or veal liver and about ten times that of pork or chicken liver.

Sodium of egg yolk and pork pancreas was lowest among the organs studied.

Liver and beef heart were highest in protein, while egg yolk, brain, pancreas, and tongue showed highest fat (ether extract) levels.

References

(1) UNDERWOOD, E. J.: Trace Elements in Human and Animal Nutrition. N.Y.: Academic Press, Inc. 1956.

(2) HEWSTON, E. M., DAWSON, E. H., ALEXANDER, L. M., AND ORENT-KEILES, E.: Vitamin and Mineral Content of Certain Foods as Affected by Home Preparation. USDA Misc. Pub. 628, 1948, p. 69.

(3) YOUDEN, W. J.: Statistical Methods for Chemists. N.Y.: John Wiley & Sons, Inc., 1951.

(4) HOPKINS, H., AND EISEN, J.: Mineral elements in fresh vegetables from different geographic areas. J. Agric. & Food Chem. 7: 633, 1959.

(5) ASSN. OFFICIAL AGRICULTURAL CHEMISTS: Official Methods of Analysis. 8th ed. Washington: Assn. Off. Agric. Chemists, 1955, p. 1008.

(6) JONES, D. B.: Factors for Converting Percentages of Nitrogen in Foods and Feeds into Percentages of Protein. USDA Circ. No. 183, 1931.

(7) HART, E. B., ELVEHJEM, C. A., AND STEENBOCK,

H.: A study of the anemia of young pigs and its prevention. J. Nutrition 2: 277, 1930.
(8) SWIFT, C. E., AND BERMAN, M. D.: Factors affecting the water retention of beef. 1. Variations in composition and properties among eight muscles. Food Tech. 13: 365, 1959.
(9) HOWELL, J. McC., AND DAVISON, A. N.: The copper content and cytochrome oxidase activity of tissues from normal and swayback lambs. Biochem. J. 72: 365, 1959.
(10) Copper in foods. Food 27: 358, 1958.
(11) Sodium-Restricted Diets—the Rationale, Complications, and Practical Aspects of Their Use. Natl. Acad. Sci.—Natl. Research Council Pub. 325, July 1954, p. 16.
(12) PECOT, R. K., AND WATT, B. K.: Food Yields Summarized by Different Stages of Preparation. USDA Agric. Handbook No. 102, 1956.

BIOGRAPHICAL NOTES FROM HISTORY OF NUTRITION
Jacques Cartier—1491–September 1, 1557

Jacques Cartier, one of the great sailors and explorers of the sixteenth century, discovered the St. Lawrence River and the land we know as Canada, a name he obtained from the Indians. Cartier also holds our interest because he left a vivid description of scurvy and a clear record of how he cured his men, using a remedy he learned from the Indians.

It was his second voyage to the New World and Cartier's ships were frozen in the ice from November 1535 to April 1536 in Ste. Croix harbor. Scurvy broke out; twenty-five men died and only three of the 110 total men were strong enough to help the sick. Cartier wrote: ". . . the sickness broke out among us accompanied by most marvellous and extraordinary symptoms; for some lost all their strength, their legs became swollen and inflamed while the sinews contracted and turned black as coal. In other cases the legs were blotched with purple-colored blood. Then the disease would mount to the hips, thighs, shoulders, arms and neck. And all had their mouths so tainted, that the gums rotted away down to the roots of the teeth, which nearly all fell out."

Cartier feared attack from the Indians and used ingenious devices to prevent them discovering that practically all his men were ill. One day Cartier saw, among a group of Indians, one who some ten days earlier had been ill with the same disease his men suffered from. He inquired of the Indian what had cured the sickness. Being told that it was the juices of leaves of a tree, Cartier said that his servant was sick and asked to be shown the tree. The Indians brought branches and showed how to grind the bark and leaves and boil these in water. When the sailors took this medicine, ". . . in less than eight days a whole tree as large and as tall as any I ever saw was used up, and produced such a result that had all the doctors of Louvain, and Montpellier been there with all the drugs of Alexandria, they could not have done so much in a year as did this tree in eight days; for it benefitted us so much that all who were willing to use it, recovered health and strength, thanks be to God." There has been considerable uncertainty as to what the tree was. Hakluyt said it was the sassafras tree, but Biggar says it seems to have been the hemlock.

Jacques Cartier was born in 1491 in St. Malo in Brittany, France, but little is known of him except his own careful records of his three voyages taken at the request of King Francis I of France to seek a northwest passage to the Orient. The civil register of St. Malo which records his marriage in 1519 shows that he was the son of Jamet Cartier and Geseline Jansart and that he was a master-pilot. He married Marie Katherine des Granches, daughter of Messire Honoré des Granches, constable of the town of St. Malo. They had no children.

Cartier grew up at St. Malo which was a busy harbor for fishing vessels to the Great Banks of Newfoundland. Probably he early became a sailor, because he is listed as a master-pilot. He must have made an Atlantic voyage by the time of his marriage. He had probably been to Brazil because later, when he went to Canada, he compared the corn he saw growing there with that which he had seen in Brazil.

Paintings of Cartier show him as a bearded man with a firm face, strong jaw, prominent brow, and keen eyes. He made three voyages: in 1534, he explored around Newfoundland; in 1535-36, he discovered the St. Lawrence River and penetrated as far as what is now called Montreal; and in 1541-42, he again explored the St. Lawrence River. Always he carefully charted the land and waters he explored. He was a daring adventurer but had none of the cruelty so characteristic of that period.

After his last voyage he appears to have lived in comfortable retirement in St. Malo but also to have spent some time in his country residence at Limoilou. He died September 1, 1557.

REFERENCES: Biggar, H. P.: The Voyages of Jacques Cartier. Published from the originals with translations, notes and appendices. Ottawa: Public Archives of Canada No. 11. 1924; Leacock, S.: The Mariner of St. Malo. Toronto: Glasgow, Brook & Co., 1914.—*Contributed by E. Neige Todhunter, Ph.D., Dean, School of Home Economics, University of Alabama, Tuscaloosa.*

Protein Intake in Liver Disease[1]

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PRIOR TO 1940, patients with chronic liver disease (cirrhosis) were kept at bed rest, given diuretic agents, and otherwise treated symptomatically. The only special emphasis on diet for these patients was the prescription of a regimen high in carbohydrate and low in fat and protein. It was believed that the diseased liver was unable to cope with large amounts of fat and that the primary role of the liver in the utilization of protein made it desirable to "spare" this organ by limiting the amount of protein presented to it for metabolism.

High-Protein Therapy

In 1941, Patek and Post (1) described the results of their treatment of fifty-four patients with cirrhosis of the liver, using a highly nutritious diet and added vitamins of the B-complex. The rationale for this emphasis on nutrition was based both on the frequent association of chronic liver disease with malnutrition and on the evidence obtained from experimental studies with animals. The latter studies included the findings that cirrhosis could be produced in animals on low-protein diets, that starvation renders the liver more vulnerable to injury by hepatotoxins, and that protection against such injury was afforded by the feeding of high-protein diets and by certain factors contained in yeast. These nutritional supplements were also protective against the deposition of excessive fat in the liver. Such protective nutrients, which included protein and certain factors in yeast, were said to exert a "lipotropic" action, later found to be due mainly to the presence of choline or choline precursors, such as the amino acids methionine, glycine, and serine, contained in proteins.

By 1948, Patek and his co-workers were able to report (2) on their experiences in treating 124 patients with cirrhosis. The daily diet prescribed for these patients contained 3500 calories derived from 140 gm. protein, 365 gm. carbohydrate, and 175 gm. fat. Their studies indicated that cirrhosis is not necessarily a progressive disease because the institution of a sound nutritional plan characterized by a high caloric, high-protein, high-vitamin diet produced improvement in signs and symptoms of the disease and significantly increased survival. The frequent association of excessive ingestion of alcohol with chronic liver disease was now attributed to the fact that alcoholism predisposes an individual to dietary errors. The resultant liver disease, which may be considered a disease of malnutrition, was therefore only secondarily attributable to alcohol. Abstinence from alcohol is obviously necessary to permit resumption of proper dietary habits, and it is on this basis that alcohol is always contra-indicated in cases where excessive ingestion of alcohol is a feature of the case history of chronic liver disease.

Subsequent to Patek's original observations, other clinicians not only confirmed the value of a high-protein diet in the treatment of chronic liver disease, but went even further by recommending intakes of protein as high as 200 to 300 gm. per day (2 to 2.5 gm. per kilogram). If patients were unable voluntarily to ingest the recommended amounts of protein, tube feedings were proposed to increase protein intake. Complemental nutrition by the intravenous route, using amino acid preparations, was also suggested by Eckhardt *et al.*, who reported (3), that intravenously administered amino acids were well tolerated by patients with severe liver disease and seemed to be of benefit in those cases where parenteral supplementation was indicated. During and shortly after World War II, there was occasion for intensive study of acute liver disease usually caused by viral hepatitis. Here, too, high-protein diets (200 gm. protein per day) were prescribed.

Protein Intoxication

However, "What is food to one man may be fierce

[1]Presented at the 42nd Annual Meeting of The American Dietetic Association in Los Angeles, on August 27, 1959.

poison to others,"[2] and so it is that a need to re-evaluate protein intake in liver disease has very recently become evident. For an understanding of the metabolic basis for this turn of events, it is necessary to return to the classical studies in the laboratories of the Russian physiologist, Pavlov.

In 1893, there appeared from Pavlov's laboratory a paper describing the metabolic effects following the production in dogs of a so-called Eck fistula, an operation in which the portal blood which normally proceeds directly to the liver is diverted into the vena cava and thus by-passes the liver (4). In animals on which such a portacaval shunt has been performed, characteristic neurologic symptoms are observed after feeding a high-protein diet, usually a diet composed almost exclusively of raw meat. To this syndrome, the term "meat intoxication" has been applied. The afflicted animals first show signs of increasing irritability, and they walk with a peculiar staggering, uncoordinated gait, lifting their feet high and then clumsily slapping them down on the pavement. As intoxication progresses, the animals seem to become blind, wandering aimlessly about and occasionally proceeding headlong into a wall. Finally, stupor develops, followed by convulsions, coma, and death. The early investigators of this phenomenon considered the possibility that ammonia toxicity might be a factor in the etiology of the cerebral symptoms, but their chemical studies on the blood were not sufficiently accurate to permit any definitive conclusions on this point.

In 1912, Folin and Denis (5) discovered that the ammonia content of the portal blood of animals was considerably higher than that of the peripheral venous-blood. Some years later, Van Caulaert and his co-workers reported (6) that the ingestion of ammonium chloride by patients with cirrhosis induced in these patients symptoms of drowsiness, confusion, and coma. These studies lent support to the suggestion that ammonia could produce symptoms suggestive of hepatic coma.

The presence of ammonia in the blood coming directly from the gastrointestinal tract was then demonstrated in 1936 by the classical studies of Kirk (7) on patients with chronic liver disease who had developed an extensive collateral circulation of the venous blood supply to the liver with resultant establishment of portal–systemic shunts. However, it was not until 1949, approximately ten years after the "high-protein era" had commenced, that Gaustad reported (8) a syndrome resembling hepatic coma in patients with cirrhosis which occurred after ingestion of protein or after an episode of bleeding into the gastrointestinal tract. The accumulation of blood in the gastrointestinal tract is, of course, the equivalent of the ingestion of a high-protein meal because of the very high protein content of blood. Gaustad correctly surmised that the absorption of nitrogenous catabolites from the gastrointestinal tract might be responsible for the toxic symptoms.

Episodic Stupor

Many reports soon appeared confirming the toxic effects of excess protein in the gastrointestinal tract in patients with liver disease. The description by McDermott and Adams (9) of the circumstances which obtained in the case of a patient on whom a portacaval shunt had been performed was particularly significant. This shunt operation, which resembles that of the original Eck fistula, permits the portal blood draining the gastrointestinal tract to by-pass the liver. Although McDermott and Adams' patient had apparently normal liver function at the time the surgery was performed, subsequently he developed reversible disorders of consciousness resembling the early stages of hepatic coma whenever he ingested even ordinary amounts of protein. Experimentally, the same symptoms could be induced by the ingestion of ammonium salts or of urea. At the time symptoms were prominent, the blood ammonia was elevated and there were changes in the electroencephalogram identical to those previously described by Foley *et al.* (10) as occurring in hepatic coma. Obviously, this train of events was entirely analogous to meat intoxication described for Eck fistula dogs years before.

McDermott and Adams introduced the term "episodic stupor" to describe this interesting syndrome of intermittent protein intoxication and thus emphasized also the correlation of the appearance of symptoms with the ingestion of protein in relatively large amounts as might occur after the principal meal of the day. A similar syndrome, which Sherlock (11) has designated "portal-systemic encephalopathy," has since been observed by other investigators, all of whom have emphasized that it is the existence of circulatory channels which by-pass the liver that invariably set the stage for the toxic effects on the nervous system of a high nitrogenous load in the intestine. In the patient with long-standing liver disease, it can be assumed that such by-passing channels (collateral vessels) have inevitably been formed in response to the elevation of portal pressure that develops.

The most serious complication of chronic liver disease with portal hypertension is the occurrence of hemorrhage from varices that may have been formed in the esophagus and in the cardiac portion of the stomach. Often an episode of hepatic coma will be precipitated by the hemorrhage, and if the hemorrhage cannot be controlled, death will obviously result. In an effort to avoid this, surgeons may perform a portacaval shunt to reduce the portal pressure and thus to minimize the danger of hemorrhage. However, patients on whom such shunts have

[2]Lucretius, de rerum natura, IV, 637.

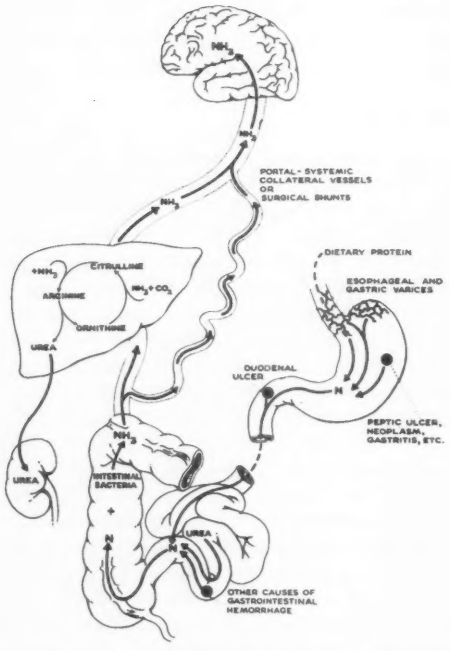


FIG. 1. *Dietary protein is the normal primary source of intestinal nitrogen. However, when gastrointestinal bleeding occurs, the blood that accumulates within the intestine may become an important source of intestinal nitrogen. Urea, which is excreted in part into the gastrointestinal tract, also adds to the intestinal nitrogen pool. All of these nitrogen-containing compounds are converted into ammonia by the numerous bacteria within the colon. This ammonia is absorbed into the portal circulation and, under normal conditions, is rapidly removed in the liver by formation of urea which is excreted by the kidneys. This mechanism of detoxification of ammonia is so efficient that little or no ammonia can be found in the peripheral blood. Because of the important role of the liver in the detoxification of ammonia, a decrease in hepatic function or a by-pass of the liver associated with (a) the development of portal-systemic collaterals or (b) surgical shunting procedures will result in increased concentration of ammonia in the peripheral blood, which will exert its toxic effects on the central nervous system (12).*

been performed are now more susceptible to protein and ammonia intoxication.

Ammonia Metabolism

The normal and abnormal aspects of ammonia metabolism in man are summarized in Figure 1. The ammonia that occurs in the blood originates almost entirely in the gastrointestinal tract, not during digestion, but rather as a result of the action of intestinal bacteria on nitrogenous substrates. These substrates include dietary protein and urea and uric acid which are excreted in part into the gastrointestinal tract. Patients with liver disease are often very susceptible to hemorrhage. The intra-intestinal accumulation of blood which may occur after bleeding into the gastrointestinal tract, then becomes an important source of increased ammonia in the blood. Although the portal blood normally contains relatively large amounts of ammonia, the liver rapidly removes it, largely by converting it to urea. Consequently in normal individuals, there is little or no ammonia in the peripheral blood. Because the liver has such an important role in metabolizing ammonia, a decrease in hepatic function or a by-pass of the liver brought about by the development of portal-systemic collaterals or by surgical shunting procedures may cause high levels of ammonia to accumulate in the peripheral blood. Under these circumstances, the toxic effects of ammonia can be exerted on the brain, resulting in the so-called hepatic encephalopathy.

Complete removal of protein from the diet is essential in the treatment of the acute phase of hepatic coma. Under certain circumstances, amino acids given intravenously may also induce ammonia toxicity, probably because these compounds are deaminated to produce ammonia more rapidly than the ammonia can be converted to urea (12, 13). During the period of recovery from an episode of protein intoxication, dietary protein can be restored gradually beginning with 20 to 30 gm. per day. The rate at which this low intake can be increased and the ultimate level which can be attained may be gauged by the effect of additional protein on the levels of ammonia in the blood. A normal or increased protein intake can be achieved safely in some, but in most patients with chronic liver disease who have a large portal-systemic collateral circulation or in patients with surgically constructed vascular shunts between the portal and systemic circulation, limited protein intake will probably be essential to the prevention of recurrent episodes of encephalopathy. Occasionally, protein tolerance can be increased by the oral administration of neomycin to reduce bacterial activity within the gastrointestinal tract. In some patients, it may be necessary to utilize intermittent treatment with neomycin for an indefinite period in order to permit the ingestion of enough protein to maintain adequate nutrition.

Although it is agreed that emphasis on good nutrition, particularly with regard to calories, protein, and vitamins, is of major importance in treating patients with liver disease, it is now quite clear that the unique role of protein as a source of ammonia in the intestine may limit its incorporation in the diet of many of these patients. The establishment of tolerance to protein in liver disease may then be as important as is the establishment of tolerance to carbohydrate in diabetes.

Summary

Prior to 1940, a low-protein diet was recommended for patients with chronic liver disease. However,

experimental and clinical studies during the next decade indicated that dietary protein deficiencies were frequently associated with the production of liver disease. Consequently, it was concluded that very large intakes of protein were essential in treating patients with liver disease. It has now become apparent that the truth with regard to protein requirements in liver disease lies somewhere between the two extremes. Many patients cannot tolerate even moderate intakes of protein because of the effect of this nutrient on the production of ammonia within the gastrointesinal tract. The abnormalities in ammonia metabolism, which are characteristic of patients with liver disease, and the relationship of elevated levels of ammonia in the blood to the production of neurologic symptoms (so-called hepatic encephalopathy) are described.

When signs and symptoms of protein (ammonia) intoxication are noted in patients with liver disease, the dietary intake of protein must be markedly reduced, or eliminated completely while symptoms are severe, as in hepatic coma. When the patient has recovered from an episode of coma, restoration of protein to the diet must be accomplished very gradually and the maximum quantity of protein that such a patient can tolerate must be established by attention to its effect on the blood ammonia.

The problem of protein toxicity is not confined to patients with chronic liver disease. It is also a feature of the metabolism of patients who have had surgically produced portacaval shunts, usually in an effort to treat the hemorrhagic complications of chronic liver disease.

The establishment of tolerance to protein in liver disease may be as important as is the establishment of tolerance to carbohydrate in diabetes.

References

(1) PATEK, A. J., JR., AND POST, J.: Treatment of cirrhosis of the liver by a nutritious diet and supplements rich in vitamin B complex. J. Clin. Invest. 20: 481, 1941.

(2) PATEK, A. J., JR., POST, J., RATNOFF, O. D., MANKIN, H., AND HILLMAN, R. W.: Dietary treatment of cirrhosis of the liver. Results in one hundred and twenty-four patients observed during a ten year period. J.A.M.A. 138: 543, 1948.

(3) ECKHARDT, R. D., FALOON, W. W., AND DAVIDSON, C. S.: Improvement of active liver cirrhosis in patients maintained with amino acids intravenously as the source of protein and lipotropic substances. J. Clin. Invest. 28: 603, 1949.

(4) HAHN, M., MASSEN, O., NENCKI, N., PAVLOV, J., ET AL.: Die Eck'sche Fistel zwischen der unteren Hohlvene und der Pfortader und ihre Folgen für den Organismus. Arch. f. exper. Path. u. Pharmakol. 32: 161, 1893.

(5) FOLIN, O., AND DENIS, W.: Protein metabolism from the standpoint of blood and tissue analysis. 2. The origin and significance of the ammonia in the portal blood. J. Biol. Chem. 11: 161, 1912.

(6) VANCAULAERT, C., DEVILLER, C., AND HALFF, M.: Troubles provoqués par l'ingestion de sels ammoniacaux chez l'homme atteint de cirrhose de Laennec. Compt. rend. Soc. de biol. 111: 739, 1932.

(7) KIRK, E.: Amino acid and ammonia metabolism in liver diseases. Acta med. scandinav. Supp. 77, Vol. 89: 147, 1936.

(8) GAUSTAD, V.: Transient hepatargy. Acta med. scandinav. 135: 354, 1949.

(9) MCDERMOTT, W. V., JR., AND ADAMS, R. D.: Episodic stupor associated with an Eck fistula in the human with particular reference to the metabolism of ammonia. J. Clin. Invest. 33: 1, 1954.

(10) FOLEY, J. M., WATSON, C. W., AND ADAMS, R. D.: Significance of electro-encephalographic changes in hepatic coma. Tr. Am. Neurol. A. 75: 161, 1950.

(11) SHERLOCK, S., SUMMERSKILL, W. H. J., WHITE, L. P., AND PHEAR, E. A.: Portal-systemic encephalopathy; neurological complications of liver disease. Lancet 2: 453, 1954.

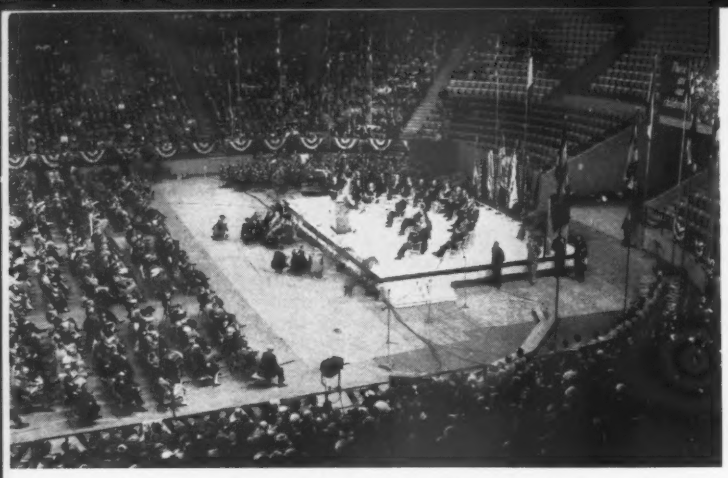
(12) NAJARIAN, J. S., HARPER, H. A., AND MCCORKLE, H. J.: The diagnosis and clinical management of hepatic coma in surgical patients. Am. J. Surg. 96: 172, 1958.

(13) HARPER, H. A., NAJARIAN, J. S., AND SILEN, W.: Effect of intravenously administered amino acids on blood ammonia. Proc. Soc. Exper. Biol. & Med. 92: 558, 1956.

(14) WEBSTER, L. T., JR., AND DAVIDSON, C. S.: Cirrhosis of the liver. Impending hepatic coma and increased blood ammonium concentrations during protein hydrolysate infusion. J. Lab. & Clin. Med. 50: 1, 1957.

Cost Accounting in Food Service

Modern cost accounting practices common in industry should also be used in the dietary departments of hospitals, according to Dr. Mary K. Bloetjes, speaking before the Eighth Congress of Pan-Pacific Surgical Association in Honolulu recently. Dr. Bloetjes, who is head of the Institution Management Department, New York State College of Home Economics at Cornell University, pointed out that with hospital costs rising, it will become increasingly necessary for administrators to do more than "divide the amount of money spent for food by the number of patient-care days. This figure—the average food cost per patient per day—does not tell whether each patient received adequate, satisfying nutrition for the the amount spent, nor does it tell whether this was the lowest cost figure for which that nutrition could be provided. Only modern accounting practices can give the accurate answer."



Opening plenary session of White House Conference on Children and Youth, March 27, 1960.

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Our Responsibilities to Children and Youth[1]

MANKIND OWES the child the best it has to give. This is the thought expressed in the United Nations Declaration of the Rights of the Child. It was fully endorsed in the first of the recommendations made by the Golden Anniversary White House Conference for Children and Youth, 1960. The dietetic profession has much to contribute to the welfare of children today. As professional people, as informed citizens, and as homemakers, we can help "to promote the opportunities for children and youth to realize their full potential for a creative life in freedom and dignity," the theme of the 1960 Conference. Foremost is the challenge to interpret to youth and the public in general the role of nutrition in the development by the child of his "full potential." Mainly people relate nutrition to their physical well-being. Much research is needed to show clearly the inter-relationships between nutrition and the mental, emotional, and social state; nevertheless, metabolic studies, human nutrition experiments, and population surveys reveal the direct effects of nutrition on personality, achievement, progress, and social stability. This is information which must be effectively brought to the attention of the public. When it is thus presented, nutrition will become an "excitable, viable, productive"[3] field of education. The scientific facts themselves are exciting to those who study and understand them, but in the public mind they must be more closely related to the total human welfare to become as "viable" and "productive" as they should. It is, therefore, important that we show more effectively than we have the relationship of nutrition to the immediate aspects of daily living.

Nutrition Education

Nutrition education was recognized in the preconference reports and at the White House Conference as a critical need. One of the three objectives of The

[1]Presented at the 43rd Annual Meeting of The American Dietetic Association in Cleveland, on October 20, 1960.

[2]A series of publications concerned with the problems of children has been issued by the Publications Division of the White House Conference. This series encompasses areas covered by the Conference in comprehensive form, and includes:

The Nation's Children—a three-volume compilation of penetrating observations on the conditions, problems, and outlook of the nation's young people. Vol. 1—The Family and Social Change; Vol. 2—Development and Education; Vol. 3—Problems and Prospects

Children in a Changing World—A book of charts presenting data from many federal sources on trends and developments pertaining to children

The States Report on Children and Youth—a digest of reports submitted by the states in preparation for the Conference

Focus on Children and Youth—a summary of reports from national organizations, including resumés of their activities concerning children and youth during the past decade

Conference Proceedings—the entire Conference story

Reference Papers on Children and Youth—specialized papers by outstanding experts on a wide range of subjects, including health, intergroup relations, delinquency, and family life

Children and Youth in the 1960s—a collection of papers by authorities on major concerns of the Conference

[3]In his address at the opening session of the 43rd Annual Meeting of The American Dietetic Association, John Schoff Millis, Ph.D., President of Western Reserve University, spoke of the importance of these qualities to professions and education today.

This is one of the Newspaper Snapshot Awards included in "These Are Our Children," a special photographic report on the children and youth of the U.S.A., 1960, prepared for the 1960 Golden Anniversary White House Conference on Children and Youth. Photo by Mrs. Ray Kirk.

American Dietetic Association, as expressed in its constitution, is to promote nutrition education. The Association has contributed much to nutrition education through its publications, its section activities, and its maintenance of high standards in the education of its members. Let us continue to expand and strengthen these contributions. An important challenge of the White House Conference of 1960 is to increase the effectiveness and scope of nutrition education and to focus attention on certain groups which, at this period in our history, seem to be especially in need of dietary improvement.

We must search for more effective motivation than we are now using. "Telling is not teaching" (1). Research is needed on this problem, but much can be accomplished if individual members are not content with well prepared lectures in nutrition, if they are satisfied only when critical evaluation has shown adoption of practices advocated.

Much of the motivation of nutrition education is focused in the relation of nutrition to physical health. This approach is relatively ineffective with youth who have little concern about their health; it is difficult to impress them with the delayed effects of malnutrition. It is important that they understand the relationships of nutrition to the immediate aspects of daily living and feeling.

Youth representatives at the Congress recognized the importance of strengthening family life by listing it as second among their priorities of important issues today. We must seek ways of interpreting more effectively the physiologic and psychologic significance of good nutrition and pleasant meals to family solidarity. With modern equipment and the abundance of convenience foods, it is easier than ever before to prepare and serve family meals.

Nutrition education today faces hard questions. For example, how can we create a cultural climate in which calories are reduced? Moderation is difficult in times of prosperity and plenty. However, this is not entirely a society of affluence. Preconference findings called attention to the fact that, in some areas, many children are hungry. Overweight and underweight are both important problems among our child population. How can we redirect mass communications which at present seem to be aimed toward misrepresentation and exploitation?

Strong recommendations were made concerning nutrition education. These may be implemented only in part by the good work we do in our jobs. Many of the measures require community action. Members of the profession are, therefore, challenged to take leadership and use their influence to see that the following steps are taken in their communities:

(a) The school curriculum include nutrition education.
(b) Lunchroom facilities be improved and extended.
(c) Maximum use of federal Surplus Commodity Act be made in communities.
(d) Health units including nutrition education be more widely established.
(e) Pregnant women be provided with a number of services, including nutrition education.
(f) Information programs be developed to educate adolescent girls about the importance of nutrition in preparation for motherhood.
(g) Parents and others in charge of feeding children be informed of nutritional requirements, as recommended by professional authorities, for the growth and development of children.
(h) Youth and their parents be alerted to the dangers of fad diets and excessive intake of certain vitamins, minerals, supplements, or health foods.

In these recommendations our national association and every state and local association can find activities of vital importance to include in their programs of work. Every member can find ways to use her information and influence in activating the recommendations in her community.

Nutrition education is linked more closely than we may think with our democratic way of life, which basically places responsibility on the individual to make choices. An autocratic government may well decree that people follow an eating pattern conducive to health. Today, in Russia, children who have poor posture are immediately sent to centers for correction of this fault. It is not inconceivable that their growing knowledge of nutrition may lead the Russians to adopt measures which will not leave good nutrition of their children to chance. Our only hope of obtaining a well nourished people is through education. We must redouble our efforts.

Cooperation with Counselors

The White House Conference gave great impetus to

guidance programs. Two questions confront our profession in this connection:

(a) How can we help counselors to recognize that food habits are vital to the welfare of youth—that improvement of food habits is often essential to the solution of behavior problems?
(b) How can we show counselors that food-and-nutrition-related professions provide opportunities capable of challenging the best minds?

Again, activity at national, state, and local levels will be needed to establish these concepts in a group of professional people whose cooperation is important in the advancement of our objectives. Development of relationships with allied professions has been an important part of the work of our Association. Herein lies a new opportunity for cooperation.

Food Service Training for Non-College-Bound Youth

Concern was expressed for the non-college-bound youth. Auxiliary dietetic training programs for those who wish to enter food service may raise the "standards of dietetic service"[4] and at the same time contribute to an important social and economic problem facing youth today.

Institutional Care of Children

What is the future for institutional care of children? An increase in residential care of special groups of children is anticipated. In the recommendations from the Conference, fourteen special groups of children were recognized: the gifted, the slow learner, the school drop-out, the delinquent, the handicapped in general, the emotionally handicapped, the mentally handicapped, the physically handicapped, the multiple handicapped, the dependent and neglected, the adolescent unmarried parents; the adopted, the migrant, and the minority. These special groups present dietary and nutritional problems that need more attention in our research and training programs, both at the college and internship level. Closely related to these special groups are the children of working mothers. Preconference statistics presented the point that 30 per cent of the mothers of children under eighteen years of age are employed, and 20 per cent of the mothers of children under age six years are employed.

Professor Eveline Burns, of the New York School of Social Work, Columbia University, said that the working mothers have contributed much to our increased wealth since the last White House Conference in 1950, but that little of the wealth has been used for the protection of the very poor children, for better housing, for services to strengthen the family, for services to working mothers, for education. The effect of our rising prosperity on children is very uneven. Income increases with size of family only to the point of two children. Fifty-eight per cent of our children are in families of three children or more. What services should be offered to working mothers to help insure a good diet for the family?

Research

Many problems relating to the attainment of the full potential by the child need further research. Although we have a working knowledge in the area of nutrition, we need to sharpen our information about the nutritional requirements to meet the various aspects of growth from infancy to adulthood.

The problem of the optimal rate of growth in relation to health in later years has not been solved. Methods of defining the state of nutrition lack precision. Interpretation of findings is not clear. The relation of diet and nutrition to dental caries, a most common physical defect, is as yet unknown. Prematurity and congenital malformations are matters of concern. The early diagnosis and dietary treatment of the so-called inborn errors of metabolism, comprise another area for investigation.

The significance and control of obesity and overweight among teen-age girls is a pressing problem. Most important to effective nutrition education is a better understanding of the attitudes which influence food acceptance and eating habits of children of all ages. Research in the effectiveness of methods of teaching and motivation is greatly needed.

This is only a partial list of problems for which we need the answers.

Conclusion

The White House Conference has been called a process with three parts: the preconference planning, the conference, and the follow-up. Of the three, the latter is the most significant. Some have said that we have not kept our promises of previous conferences to our children. Let us not be guilty of a repetition of this offense.

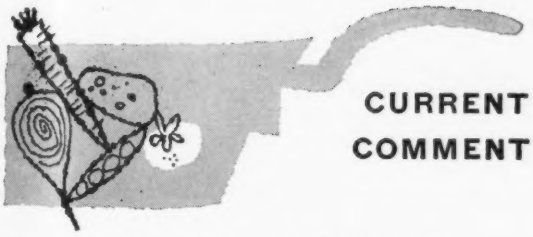
Through imaginative and creative programs and through concerted efforts, the members of the dietetic profession can improve conditions among our children. When the Conference of 1970 convenes, may The American Dietetic Association point with pride to its contribution to children and youth.

Reference

(1) SCHINDLER-RAINMAN, E.: Telling is not teaching. J. Am. Dietet. A. 37: 118, 1960.

[4]See the objectives of The American Dietetic Association in its constitution.

Of every $20 spent on groceries, the USDA reports, $1.40 to $2 goes for packaging—to keep the food in good condition and to draw the customer's attention to the product. Sometimes the package may cost as much as the food itself.—*From Agricultural Marketing, January 1961.*



CURRENT COMMENT

Consultant or Shared Dietitian?

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Consulting Dietitian,
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SERVING as a consultant dietitian can be fun! Jokingly, many people tell me that I am "riding the circuit," and they are right. Actually, I am not a consultant in the strictest sense, because, although my work includes some things which are purely consulting in nature, some of my work is more nearly that of the shared dietitian. Living in a small community and working in several hospitals of 50 beds or less has opened up many new and exciting areas to me, and I have never received as much personal satisfaction from being a specialist in a field and gaining prestige in a community as I have in doing this kind of work.

I had been in Fayetteville only a short time when word "got around" that there was a dietitian in the area. I had already contracted to teach three courses at the University of Arkansas, and I had agreed to be the adviser for the girls majoring in dietetics who intend to take an internship. There were three hospitals within a radius of 10 mi. which were feeling the need for a dietitian but which could not individually afford a full-time person. The administrators of these hospitals met with me and asked that I give them each as much time as possible. I agreed that during the summer, I would spend full time between the three hospitals. When the University was in session, I could spend about 24 hr. a week in the hospitals.

We decided that I would work on an hourly rate at the hours which would be convenient to me. My pay time was to include any hours spent at home in writing menus or procedures. Such freedom is, of course, a big selling point for this work.

I also insisted that, before beginning any corrective measures in any hospital, there be a dietary supervisor, for my services would be useless if there were no one to carry out my plans when I was not on duty.

This meant that one administrator had to promote her best employee. The other two already had persons serving as supervisors, but without any special training for the work. When I surveyed these hospitals, I found that one of these supervisors had been lifted from the ranks because she was a good cook and had been a faithful employee. From the first, I had doubts about the value of trying to train her. The third hospital, however, had a strong supervisor, who, with a little help and support, had excellent potentialities.

The administrators of these hospitals all had a sincere desire to improve their dietary departments and realized that there were many problems which only an experienced dietitian could help solve, including organization, supervision of diets, and employee training. The physicians in the community were also beginning to feel that a dietitian could give them much assistance.

I agreed to go into each hospital for a one-day survey and to write a report for the administrator detailing the areas in which I thought I could offer the greatest service. All three administrators "prepared" their employees for my coming by explaining that I was there to help and not to spy on them. Most were delighted to have someone around who "understood" their problems.

Surveying the Hospitals

The lack of supervision was the first thing I noticed as I began my surveys, all of which re-emphasized my feeling that there *must* be a supervisor on the scene through whom I could work.

Menu writing, I found, was almost nonexistent. Most of the hospitals had a set of menus which were repeated on a three-week cycle. The menus themselves had been tacked up on the bulletin boards so many times that they were ragged and almost illegible as well as out dated. I remember that on one of the hottest days in August, roast turkey with dressing and pumpkin pie were on the menu which obviously had been written for a Thanksgiving in some past year. For once, it was a good thing the cook did not follow the menu and omitted the pumpkin pie. Such menu procedure is typical, I am sure, of many hospitals which lack good dietary supervision. The morning cook came to work, looked through the refrigerator, and decided what she would serve for lunch. When the evening cook came on duty, she would follow the same procedure with practically no communication with the morning cook. I found the same situation in a fourth hospital which I have recently added to my schedule. Needless to say, good nutrition was overlooked in many cases. Meat and potatoes were the backbone of the menu, and variety was at a minimum. Standardized recipes were seldom used. Sometimes a household recipe was doubled or tripled, but that was the extent of standardization.

It is easy to understand what was happening to therapeutic diets. In none of the hospitals was a modified diet written in the dietary department. The medical staffs in all three hospitals had decided to use the *Arkansas Diet Manual* in ordering their

diets. However, many did not follow their own dictum and if they did, they could never be sure that the order would be followed precisely. Regardless of the order that reached the kitchen, someone's interpretation of the *Manual* would appear on the tray. "Light diets" are not specified in the *Manual,* but they were ordered by the dozens. On questioning staff members I found that the concept of a "light diet" ranged from a clear liquid diet to merely small portions.

Also, many unusual diets were ordered. A "low-carbohydrate" diet order was finally traced to a diabetic patient. Another order read: "Diabetic diet, 85 to 150 gm. CHO." I also saw a 2000-calorie reducing diet order, but never saw a sodium-restricted diet which gave the milligrams of sodium. These diets were ordered as "low-salt" or "salt-free," many times with bacon for breakfast added. This meant, of course, that not only the kitchen employees but also the medical staffs needed instruction. In most cases, physicians used the Exchange System in ordering diabetic diets, but orders only called for the total number of calories without any breakdown. For diabetic diets, most of the physicians use printed forms put out by the pharmaceutical companies. However, the administrators, in their eagerness to have me do anything I could to help them, arranged to introduce me to their medical staffs so the physicians would know that my services were available for therapeutic diets whenever needed. I was well received.

Sanitation standards in all of the hospitals were rather lax. Few hospitals in the area have ever been visited by a health inspector. I do not mean to imply that I found dirty kitchens: this is not true. The kitchen workers did an excellent job of keeping their kitchens clean by their household standards but not by institutional standards. No one had been trained in good sanitation techniques. Hands were used almost exclusively for handling food. Tongs were not usually available, and if they were, the workers did not use them because "they did not have time to fool around with those things." Uniforms were not supplied in any of the hospitals, although all employees were required to wear some kind of uniform. However, only two hospitals specified the type. Work aprons were not provided for the cooks. If they wanted them, they brought them from home and had to keep them clean themselves.

Dishwashing presented a big problem in most places. Many times only one woman was assigned to wash all the dishes. She would handle the dirty dishes and then the clean ones without washing her hands. Frequently the dishes even looked dirty and had to be spotted before they could be used for serving. Establishing good sanitation standards required considerable training of employees and that could not be done quickly.

There were many other problems, of course.

Class for Food Service Managers

Following the surveys, my initial efforts were directed toward training the food service managers, the name the administrators decided on for their dietary supervisors. I planned to meet with these managers and their assistants weekly for a general training program. Interestingly, at this point, the Northwest Arkansas Hospital Association asked if I would extend my training program to a formal class and accept other food service managers from all of Northwest Arkansas. I agreed and charged a tuition fee for employees of the hospitals other than those for which I was already serving as a consultant. The administrator of a centrally located hospital offered the use of his dining room for these weekly meetings which I held for twelve weeks from 3 to 4 o'clock on Friday afternoons. Seven hospitals sent employees, making my class total thirteen people. Two women traveled 125 mi. each way through the Ozark Mountains to attend the classes. Absenteeism was almost nil.

These classes were a tremendous challenge. I am afraid that many of us, bogged down with our technical knowledge, sometimes forget how to put it into a language that can be understood and used by people with no background in dietetics.

I divided the instruction into two periods of six weeks each. The first six weeks were spent in the interpretation of the *Arkansas Diet Manual,* because this seemed to be the most urgent need.

These lessons were of the laboratory type, with class members actually writing diets. At the first meeting, I gave each one a big piece of wrapping paper about 24 in. square, ruled off for the seven days of the week and three meals of the day. For home work, each was asked to write a week's menus similar to those served in her hospital. The next week, at the coffee hour following class, I reviewed the home work of each one. Next I devised some simple forms for all the modified diets we were discussing. After each discussion, the home work assignment was to make out a week's menus on that particular diet, based on the normal diet pattern. This procedure brought out many questions while they were still fresh in the students' minds.

The second six weeks of the course were devoted to problems of supervision of the dietary department, and followed an outline:

a. Menu planning and exchange of recipes.
b. Correct purchasing methods
c. Sanitation in the kitchen—film on dishwashing
d. Employee relations
    (1) Job analysis
    (2) Scheduling of employees
    (3) Evaluation of employees
e. Qualifications of a good supervisor
f. Supervision and training of new employees—film on supervision

This last-half program was organized for group participation. The women delighted in bringing recipes to class to share with their "friends," as well as samples which could be enjoyed at the after-class coffee hour. They became most interested in standardized recipes, and I arranged for them to receive quantity recipes from a number of the commercial food companies. Few of these hospitals had been on such mailing lists prior to my requests. The women were excited over the information they received from these companies and reported many favorable results from these new recipes. The compliments from patients and personnel, and the obvious advantages of being able later to duplicate products, resulted not only in their understanding but appreciating standardized recipes. We also discussed uses of powdered milk, and I believe that most of the hospitals started using it for all of their cooking.

I had found that purchasing methods were, on the whole, quite "primitive." Purchasing was customarily done first and then menus were planned to use what was on hand. And, most used regular household size quantities, rather than No. 10 cans. We discussed this. At first the managers argued that it would be a waste of food to use large cans, but after we considered menu planning using the larger sizes, many made the switch. They were even able to persuade the local merchants, where they usually did their purchasing because of community pressures, to stock the larger sizes. Here again, as home work, each student made out weekly purchasing orders from her master menu.

At the last class, many of the students brought their administrators, and the host institution for the class gave a reception for the group. The comments of the administrators were very complimentary and several asked if I could give them some time, even if it were only one day a month. I did promise one of the closer hospitals that I would extend my personal service to it within a few months, but so far I have been unable to work it into my schedule. One problem is the travel time involved. However, I still hope that, in the future, I shall be able to include it.

The food service managers gained much, I am sure, from these classes. A much greater gain would have been realized, of course, had it been possible for me to follow the program in each institution.

Service to Individual Hospitals

My work in the three hospitals has been quite intensive and different in each. One required little time, because the food service manager was a long-time employee who was functioning adequately and to the satisfaction of the administrator. The major problem in this hospital was the dishwashing equipment and procedure. By having a consultant's recommendation, the medical staff and the administrator persuaded the trustees to purchase a new dishwashing machine almost immediately. The food service manager then set up a good procedure. At present, I go to this hospital only when called to write a modified diet which is not in the *Diet Manual* or to attend meetings with the administrator and architect for planning a new kitchen for their expansion program. This administrator is anticipating employing me on an almost full-time basis for re-organizing and retraining personnel when the new dietary facilities are ready for operation.

I have spent much time in the other two hospitals in training a new supervisor in one and attempting to retrain a longer employed supervisor in the other. In the beginning, these persons needed much of my time; as they and their employees became better trained, of course, I found that I could shorten my hours with them. However, when I feel that they are becoming somewhat lax, I spend additional time with them and apply pressure to improve performance. One hospital recently opened a new kitchen, and I spent almost a month in organizing it. Fortunately, through my University contacts, I was able to find and recommend a qualified dietitian to take over the dietary department. She had been out of active practice for a number of years because of family responsibilities but had kept fairly well abreast of developments by reading this JOURNAL. I provided personal supervision during her first few weeks and will continue my consulting service when needed.

The first thing I did when I started working in these hospitals was to take over the menu writing, since purchasing, scheduling employees, and so on are dependent on the menu. I insist that daily menus be typed and posted for everyone to see. I taught the supervisors to write any instructions they had for the cooks in red pencil on the menus. At first, the cooks paid no attention to the instructions, and sometimes they paid no attention to the menus.

This was one of the first difficult tasks that the food service managers had to face. Here, let me repeat that I did not begin service in any hospital until there was a person responsible for supervising the dietary department through whom I would work. The managers finally learned that with firmness, the cooks would understand that they *must* follow the menus. With the menus are included recipes for any new items in the quantities needed. In this way, a recipe file is formed which is workable in each hospital. It is gratifying that the cooks now ask for recipes, even though it sometimes puts the manager on a spot, as she has not been able to compile all the recipes. This situation is improving with time, however, and the cooks actually feel much more secure when they have a written order to follow.

From menu writing, my next efforts were concerned with purchasing. Purchasing was done without system, by various persons, frequently by those

with no knowledge of the dietary department. My initial casual inventory of the store rooms disclosed so many items that I spent the first six months in one hospital writing menus to reduce inventory. Five cases of marshmallows in a small hospital become a big problem. I am sure that the patients thought I was "marshmallow happy" before they were finally all used. In this particular hospital, hardly any orders for staples were placed for six months. The other hospital was not quite as bad, but it, too, had much too large an inventory for normal conditions. And, there were many specialty items on the shelves. No thought had been given to cost when purchasing was done.

I taught the food service managers to set up a simple daily food order following the menu and to make weekly purchases based on these orders. I have also taught them not to keep a large inventory. Actually, there is not enough storage space for a large inventory, and the amount of food needed in a small hospital would not be sufficient to enable purchasing at quantity prices.

I am very happy that all of my administrators place the ideal of good food service ahead of dietary cost, even though, in general, I have been able to improve the quality of food service with little or no increase in cost. Of course, extremely accurate food accounting systems are not used.

Next I turned to employee relations and began by setting up a system for scheduling employee work time. I use simple graph paper and do a month's schedule at a time. The master schedule is posted on the department bulletin board. This scheduling is now the responsibility of the food service manager.

I am now working on job specifications and will incorporate these in a standard procedure book for each hospital. The next important step will be to establish an evaluation system for dietary employees. One food service manager has already introduced a simple system. She reviews her evaluations with her administrator, and on this basis, salary increments are given to the employees.

There has been obvious improvement in following modified diet orders. During my classes I developed a simple form on which the food service manager writes diabetic diets using the Exchange System and another form which can be used for all other modified diets. If the physician asks for a diet which is not listed in the *Arkansas Diet Manual,* the food service manager now has enough confidence to ask what listed diet he wants. If the diet is not listed and requires a special calculation or is a combination of diets, or if the patient is having some problems, I am called for a conference with the physician. I then write these diets after talking with the physician and the patient. All hospitals are now measuring foods when required; some even weigh the quantities. One thing that the food service manager knows is that I am always available to help when there is difficulty with any diet. This is by instruction of the individual administrators who have delegated authority to their food service managers to call the consultant when necessary.

Most of the hospitals in the area are currently planning new kitchens because of expansion programs to increase capacities to 100 beds or more. I have been spending considerable time with administrators and architects in developing plans. This has been difficult because some of the architects and equipment companies have not been too happy about having someone question their work. In one case, the plans were drawn and contracted before I appeared on the scene. Some of the expensive equipment put in has disturbed me, because it is not needed and would not pass some sanitation laws. I feel somewhat inadequate in these situations, because I am trying to change long-standing practices of architects and equipment companies. However, because of the administrators' confidence, I have been able to effect some changes in dietary layout and equipment, even though at an increase in cost, due to the lateness of the changes in the construction program. Obviously, it would be impossible to change plans completely after construction was started. Fortunately I began my consulting service early enough in some hospitals to participate in the preliminary planning phase.

A few months ago I extended my consulting service to a fourth hospital about 18 mi. from my home. It is operated for a city by a Catholic sisterhood. Here I encountered many of the same problems. The greatest was that there were three cooks with no supervision. Again, I would not begin service until the administrator had assigned a supervisor. The dietary supervisor is a member of the order, but all other personnel are lay employees. I have been spending a full day each week in training the supervisor, and she has been an excellent pupil. The hospital is anxious to raise its dietary standards and has followed every recommendation I have made. Another kitchen employee has been hired, and some construction has been done to improve procedures. This is the first hospital that has had a cold tray assembly table built to my specifications. Also, a small rolling steam table has been provided for hot plate assembly. I was interested to find that the tray assembly system used in a large hospital in St. Louis could be effectively scaled down to fit the needs of a small hospital.

In closing, let me recommend—as strongly as possible—this type of work to other dietitians. There must be many qualified dietitians now not engaged in full-time practice of our profession who could readily develop this type of consultant–shared dietitian type of service among smaller hospitals in their areas. Such service can also serve to resolve the question of marriage vs. career—you not only have but can do justice to both.

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Cycle Selective Menus for a Hospital Chain

ANN HAINS

Director, Nutrition and Dietary Service,
Harlan Memorial Hospital
Miners Memorial Hospital Association
Harlan, Kentucky

EFFICIENT USE of dietitians' time and talents continues to be a problem of great concern, not only in specific situations, but to the profession as a whole, and the problem will not diminish in importance in the future. Many proposals have been made for using dietitians' time more effectively, one of the most widely accepted being the cycle menu, because of its concomitant advantages in addition to time-saving. In the area of purchasing, cycle menus—regardless of the length of the cycle—allow for greater accuracy and precision in purchasing. More effective patient care and departmental management are also possible with cycle menus, since dietitians are relieved of the repetitious and time-consuming job of menu planning.

Cycle menus may adequately meet the patients' dietary needs and, contrary to popular opinion, need not be monotonous or strictly regimented. When properly planned and executed, the cycle menu can become one of the dietitian's most important management tools. Benefits of this procedure have been reported for individual hospitals (1, 2). We feel, after five years' experimental use of a cycle plan in the southern regional group of the Miners Memorial Hospital Association, that it can also be recommended for complexes such as ours, provided the hospitals involved have certain similar characteristics. The patients should have similar dietary needs, and the hospitals should be located in the same general delivery zone. Also—and very important—the dietitians or food service supervisors in the individual hospitals must be willing to accept central direction on menu planning and purchasing.

Our "chain" of five related hospitals in small towns in the southern Appalachian Mountain coal mining area forms the southern regional group of the ten-hospital network of the Miners Memorial Hospital Association. Harlan (Kentucky) Memorial Hospital, with 200 beds, is the largest in the regional group and serves as the central hospital. The other four community hospitals, which are professionally and administratively related to the central hospital, are the Memorial Hospitals at: Whitesburg, Kentucky (90 beds); Hazard and Middlesboro, Kentucky (80 beds each); and Wise, Virginia (60 beds). Together they provide over 500 beds and have very active out-patient clinics, as well. The smaller hospitals are about 1 to 2 hr. driving distance from Harlan.

How the Cycle Menus Were Developed

Before the first master or cycle menus were planned, a dietitian toured the area to learn the food habits of the population the hospitals serve. She talked with state health department nutritionists, food service operators in hospitals and restaurants, and grocers. She found that the most commonly used foods were pork, chicken, prepared cold meats, eggs, hot bread, mature green beans, all varieties of greens, dried beans, apples, bananas, carbonated beverages, and store cakes and cookies.

This information was, of course, used in planning the menus. However, the variety was widened to accommodate the personnel and visitors served in the pay cafeterias in the hospitals, since most of the professional and technical personnel come from outside the area and represent all sections of the United States as well as several foreign countries. Thus the situation required that a large variety of foods, as well as frequent repetition of locally preferred foods, be available. For this reason, a selective menu was adopted.

For practical reasons, a skeleton menu was used in building the cycle menu. This skeleton or outline is as follows:

Breakfast

Juice: 2 or 1 fruit and 1 juice
Cereal: 1 cooked and 1 ready-to-eat
Egg: choice of preparation—poached, scrambled, or fried
Meat: bacon or sausage
Bread: 1 sweet hot bread

Dinner and Supper

Fruit juice: 1*
Soup: 1*
Entrées: 2 (or 3*)
Potatoes or substitute: 1 (or 2*)
Hot vegetables: 2 (or 3*)
Salad: 1 (or 2*)
Dessert: 2 (or 3*)
Hot bread: 1

Evening Nourishment

Milk
Fruit juice
Graham crackers, saltines, or cookies

*Additional items when required for therapeutic diets

Certain staples are available with all menus: white and brown bread; butter; jelly; milk—chocolate, skim, butter, or plain; hot or iced tea; coffee and decaffeinated coffee; cream; sugar; salt, and pepper. The same menu form is used in all five hospitals.

A six-week cycle was chosen on the basis of availability of foods and the possible time-saving in planning the menus. During the first two years, the dietitian in each of the four smaller hospitals was given an opportunity to plan one six-week cycle or "master" menu. Each was used four times, in rotation. After two years' use, the staff at Harlan Memorial Hospital, the central hospital, reviewed

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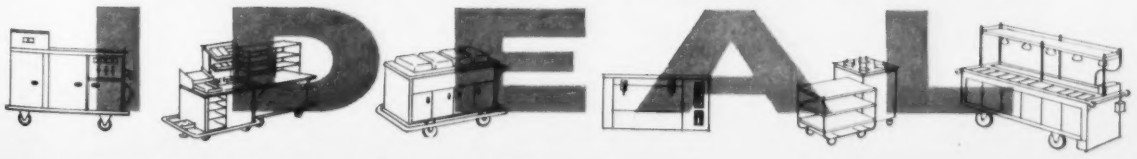

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these menus and revised them to provide a new, composite master menu. This was thoroughly checked for repetition, cost, and adequacy, before being put into use. It was used for a little more than a year, at which time, it was re-analyzed and a few minor changes made to incorporate several new products. The master menu will continue to be subject to periodic analysis and revision as the need arises.

How the Menus Are Used

The dietitians in the individual hospitals are, of course, permitted some leeway in using the master menu. Part of this local variation is planned right into the master menu when it reads, for example: "½ grapefruit or segments; fresh fruit in season; deviled pork chops or spare ribs." Thus, if a delivery is short or inferior merchandise is received, the dietitian on the scene has authority to make the required changes to meet the emergency. In season, too, good local crops of strawberries, blackberries, green beans, and tomatoes are available and are served once or twice daily, according to the local dietitian's judgment. She is also expected to make adequate substitutions in the event of radical changes in the price of food items.

Each dietitian keeps exact records of food prepared or used, census, income, and weather conditions. These records provide an efficient basis for writing specifications and purchasing, requisitioning stores, and food preparation. Central purchasing agents for the Miners Memorial Hospital Association now know—well in advance—what foods and the approximate amounts that will be needed by the five hospitals of the southern regional group. They thus have sufficient time to search for "best buys," to negotiate discounts on volume purchases, and to arrange for deliveries.

A fairly stable raw food cost over the period the menus have been used has been achieved. Food costs of the individual hospitals are determined by central accounting from records supplied by each hospital. As expected, the per-meal cost in the smaller hospitals is slightly higher than in the larger central hospital. However, there has been little variation in the per-meal cost between the individual hospitals since the six-week cycle menu has been used. (Comparative studies of savings cannot be made, since the cycle menus have been used from the time the hospitals opened.)

By repeating the same six-week master menu over a period of a year, a number of benefits have accrued. This period allows ample time both for working out a good set of menus and having several people check it thoroughly. Also, since items are repeated with fair frequency, precise standardization of recipes and serving portions has become possible. This in turn makes more work time available in the individual hospitals—through repetition of familiar procedures for accepted recipes—for the development of new recipes and greater menu variety later.

The cycle selective menu for patients has proved satisfactory, with some additions, for the pay cafeterias. The menus include suggested additions for desserts and salads, the number used daily being determined by the size of the operation. In addition, all cafeterias regularly serve fresh fruits in season, baked custard, sliced cheese, and assorted cold cuts. The same choice of salads and desserts are used at noon and at night, unless a substitution is needed when items are sold out. Leftover entrées and desserts are frozen for later use at times when substitutions may be required.

Our greatest satisfaction in using the cycle selective menu has been the way it has been accepted by both patients and personnel. The dietitians are especially pleased to observe changes in food selection. There has been a marked increase in the consumption of salads, meat, and a large variety of vegetables and fruits, which relates directly to the variety provided by the selective menu and adequate spacing and different combinations in the six-week cycle. It has also been interesting to note the patients' lack of awareness of the use of a cycle menu.

We can visualize the use of a six-week cycle menu for any group of hospitals where patients and personnel have the same general needs and food habits. The cycle menu—whether a selective or no-choice menu—can free the dietitian to devote more time for searching for new ideas, training personnel, estimating purchasing and production needs, and patient care. We feel it would be especially useful in the case of two or three small hospitals for which a shared dietitian or consultant is employed. The same menus, recipes, and purchasing specifications could be used in each hospital, thus spreading the dietitian's coverage without diluting the quality of service to patients.

References

(1) PINNEY, E. V.: Cycle menus, tempered with flexibility, have advantages. J. Am. Dietet. A. 31: 901, 1955.

(2) Cycle menu plan adapted for selective menus. J. Am. Dietet. A. 34: 1308, 1958.

The Department of Agriculture inspects and certifies as wholesome more than 20 billion lb. of red meat each year—10.3 billion lb. beef, 8.8 billion lb. pork, 613 million lb. lamb and mutton, and 604 million lb. veal.

eggs... how many... how often?

The athlete in intensive training may eat six or more eggs for breakfast; the middle-aged patient recovering from a heart attack may be advised to confine his intake to one or two a week or to eat none. Where then, between these extremes, do eggs fit in day-to-day eating and in dietotherapy?

In the normal diet, eggs as the heart of a traditional American breakfast, as the main dish of a hearty luncheon or supper, as garnish for vegetables and salads, or as ingredients in cookery, provide many essential nutrients: protein of unexcelled quality, an appreciable amount of polyunsaturated linoleic acid, and needed vitamins and minerals.

In dietotherapy, when the need to maintain adequate nutrition is paramount, eggs are given an important place in many diets. The importance of their nutritional value, the ease with which they are digested, and their appreciable content of polyunsaturated essential fatty acids are reasons why eggs are retained in the diet, even when reduced fat intake is recommended.

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Saturated (total)	4 Gm.
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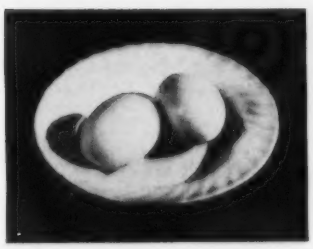
Oleic acid	5 Gm.
Linoleic acid	1 Gm.

Vitamins present: A, D, E, K, B_1, B_2, B_6, B_{12}, pantothenic acid, niacin, folic acid, biotin.

Minerals present: Calcium, phosphorus, sodium, potassium, chlorine, sulfur, iron, iodine, manganese, magnesium, zinc, copper.

**U. S. Department of Agriculture Home and Garden Bulletin No. 72, Sept. 1960.*



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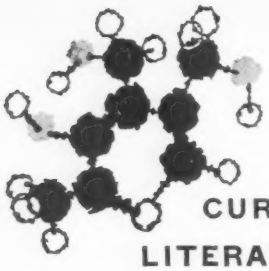

CURRENT LITERATURE

Contributed by Janette C. Carlsen, the Johns Hopkins Hospital, Baltimore; Clara Karl Frederick, Lombard, Illinois; Margene A. Wagstaff, Elmhurst, Illinois; the following dietetic interns: VA Hospital, Houston—M. Janelle Brumbelow, June Davis, Sally Gilliland, Ann Jonson, Mae Margaret Lewis, and Travis Shaw; VA Center, Los Angeles—Cynthia G. Danielson, Margaret E. Dorsey, Mary Flick, Viola Hardin, Carolyn Hendricks, Kristin Holmberg, Karen Mund, Margaret Norton, and Patricia Wallace; and Frank E. Rice, Ph.D., Consultant-Nutrition Research, Chicago.

THE AMERICAN JOURNAL OF DIGESTIVE DISEASES

Vol. 6, January, 1961

*Stimulating effects of various foods on gastric-acid secretion. C. F. Code.—p. 50.

*Physiologic approach to medical management of duodenal ulcer. M. I. Grossman.—p. 56.

Stimulating Effects of Foods on Gastric-Acid Secretion. Although only a small number of foods were tested, the data will help in selecting foods for diets designed either to stimulate the secretion of large quantities of hydrochloric acid or to reduce secretion to exceedingly small amounts of acid. For example, if the objective of the physician or the dietitian is to "exercise" the parietal cells of the gastric mucosa, foods containing large amounts of protein should be selected, such as fish, chicken, meat, cheese, and milk. If, on the other hand, the objectives are to place the parietal cells at "rest," then foods containing a large proportion of carbohydrate and some fat should be selected, such as fresh or cooked fruits, white bread and butter, potatoes, and other vegetables, with only enough meat and dairy products to fulfill minimal protein requirements. Tables of gastric-acid equivalent values of different foods are included.

Medical Management of Duodenal Ulcer. The notion that dietary management is beneficial in ulcer treatment is so firmly entrenched by tradition that the demonstration by carefully controlled studies that it is of no value in long-term treatment seems hardly to have influenced its popularity. The clinical impression that patients with active ulcer disease have less distress if they eat small meals of simple foods is probably valid, but the generalization based on this observation that a bland diet will speed healing is gratuitous. If full-sized meals three times a day tend to produce distress, dividing the diet into five or more feedings may provide comfort. Diet cannot be regarded as an important therapeutic device. In the early phases of treatment of an acute exacerbation, the patient will probably be more comfortable with a diet of the type usually labeled bland. Thereafter, there need be no dietary restriction unless dictated by specific consideration in the individual patient. Foods that cause distress should be eliminated. Coffee, tea, and the "cola" soft drinks contain amounts of caffeine capable of stimulating gastric acid secretion. Ideally, the use of all caffeine-containing beverages should be banned in patients with duodenal ulcer. If the patient finds it difficult to forego their use, he should be advised to use them in moderation and take them only with food. The same is true of alcoholic beverages because of their stimulating effect on gastric acid secretion.

THE AMERICAN JOURNAL OF THE MEDICAL SCIENCES

Vol. 241, January, 1961

*Effects of exercise and isoproterenol on free fatty acids and carbohydrates in cardiac patients. R. A. Bruce, L. A. Cobb, and R. H. Williams.—p. 59.

Effects of Exercise and Isoproterenol. It has been reported that the plasma concentration of non-esterified free fatty acids (FFA) increases with fasting or injection of epinephrine, and diminishes with feeding oral glucose or injections of insulin. The fall in FFA concentration is interpreted to represent a regional suppression of release of FFA. The authors of this study compared, in cardiac patients, the effects of exercise and myocardial stimulation with isoproterenol on peripheral mobilization and apparent utilization of FFA. Carbohydrate utilization and production of lactate were also determined. Leg exercise increased aerobic and anaerobic metabolism and lowered the arterial and iliofemoral venous FFA. Isoproterenol markedly increased FFA levels and cardiac output without significantly altering metabolism.

AMERICAN JOURNAL OF PUBLIC HEALTH

Vol. 51, January, 1961

*Methods of dietary assessment in current epidemiologic studies of cardiovascular diseases. M. Cantoni, R. S. Paffenbarger, Jr., and D. E. Krueger.—p. 70.

*Time-temperature effects on salmonellae and staphylococci in foods. R. Angelotti, M. J. Foter, and K. H. Lewis.
I. Behavior in refrigerated foods.—p. 76.
II. Behavior at warm holding temperatures.—p. 83.

Dietary Assessment in Studies of Cardiovascular Diseases. Methods being used in dietary assessment in several epidemiologic studies of cardiovascular diseases are reviewed. These studies aim to determine whether persons with a certain dietary pattern experience a different risk of a specific cardiovascular disease than do persons with other dietary habits. Nutritionists are assisting in the design of studies, the collection of data, and in the verification of information. Dietary observations are being made by means of history-taking, self-administered questionnaire, and diary-keeping. Comprehensive dietary information is recorded and once general associations have been shown, individual dietary components and patterns can be examined for specific relationship to disease. Problem areas in the conduct of these studies are outlined and analyzed.

Salmonellae and Staphylococci in Refrigerated Foods. This paper is concerned with the growth responses of salmonella and staphylococci below 50°F. Various cultures were grown in custard, chicken à la king, and ham salad for five days at 2°F. intervals from 40°F. to 50°F. and at 95°F. The growth of salmonella and staphylococci was prevented in perishable foods when the internal temperature was at or below 42°F.

Salmonella and Staphylococci at Warm Holding Temperatures. This study presents information on the response of salmonella and staphylococci in custard, chicken à la king, and ham salad held at warm temperatures, i.e., 95°F. to 120°F. The temperature growth range was 44°F. to 114°F. Good growth of the test organisms in all three foods was observed at 95°F. Holding perishable foods in the midportion of this range (44°F. to 114°F.) for periods that permit growth of salmonella and staphylococci should be avoided.

THE AMERICAN JOURNAL OF SURGERY

Vol. 101, January, 1961

*Experience with the use of the right colon to replace the esophagus. J. T. Reynolds, V. L. Guynn, W. L. Grove, and H. Javid.—p. 39.

Nutritional Foundation for Surgery. When the replacement of the esophagus with the right colon is indicated, the procedure, which is very long, requires that the patient be in an excellent nutritional state. A diet of 3000 calories, 150 to 200 gm. protein, and a deliberate oversupply of essential vitamins must be in effect three weeks before surgery, in order to retain a positive nitrogen balance. Following the first stage of the operation, attention must again be focused on the nutritional state of the patient. Weight gain, increased strength, and increased interest are important criteria for the second step of the operation. The colon is prepared by administering sulfasuxidine and a low-residue diet for a week. Then the second stage is performed. The results of this operation have been very satisfactory.

ANNALS OF BIOCHEMISTRY AND EXPERIMENTAL MEDICINE (India)

Vol. 20, May, 1960

*The effect of feeding diets containing insect-infested jowar on the growth and compo-

continuous *air recirculation**

holds all compartment temperatures at proper serving level

Two fans gently and constantly re circulate hot and cold air around filled trays even while the cart is being moved to the patient floor.

While in transit, special rechargeable batteries operate two fans inside the cart. This continuous air re circulation prevents the hot and cold air from forming stagnate pockets. Door operated switches automatically shut fans off while trays are being assembled.

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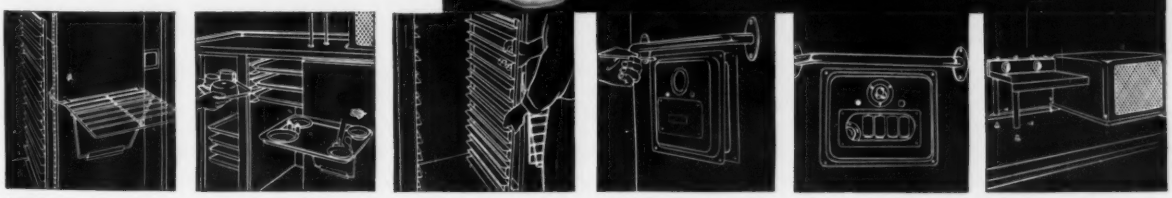

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sition of blood and liver of albino rats. S. V. Rao, A. P. Jayaraj, R. K. Bhagavan, A. N. Sankaran, M. Swaminathan, and S. Sriramachari.—p. 135.

Effect of Feeding Insect-Infested Jowar. The effect of feeding a poor vegetarian diet containing insect-free and insect-infested jowar and Bengal gram on the growth, structure, and composition of the liver of rats was investigated. The mean weight gain of rats on the uninfested jowar diet was slightly greater. The average fat content of the livers of rats fed on the infested jowar diet was significantly higher than that of the livers of rats maintained on the uninfested jowar diet.

BRITISH MEDICAL JOURNAL

No. 5217, December 31, 1960

*Tests for carcinogenic activity in food. Leading article.—p. 1941.

No. 5218, January 7, 1961

*Aspects of carbohydrate metabolism in kwashiorkor. D. Slone, L. S. Taitz, and G. S. Gilchrist.—p. 32.

Tests for Carcinogenic Activity in Food. There is naturally some anxiety that carcinogenic materials may inadvertently be added to man's environment as a result of technologic advances, and those faced with the responsibility of demonstrating the harmlessness of the food products they wish to sell ask what type of tests should be made. The testing of carcinogens in the U. S. and Britain differ significantly. The fact that two groups of experts, though sharing much common ground, differ significantly in their views on what are the best types of tests is only to be expected when a scientific problem remains in the melting pot. Perhaps more useful evidence will emerge from the operations of rival systems than from uniform obedience to a single set of recommendations.

Carbohydrate Metabolism in Kwashiorkor. Fasting blood sugar levels in patients with kwashiorkor were studied and shown to be substantially lower than those of normal controls. Intravenous glucose-tolerance tests were performed on nine cases of kwashiorkor. These curves showed evidence of mild glucose intolerance. It is suggested that the occurrence of fatal hypoglycemic attacks in protein malnutrition may in part be due to the presence of a defect in gluconeogenesis.

THE CANADIAN MEDICAL ASSOCIATION JOURNAL

Vol. 83, December 3, 1960

*The effect of artificial modification of food on the serum cholesterol level. L. Horlick.—p. 1186.

*Diet and degeneration. J. A. Little.—p. 1202.

Vol. 83, December 17, 1960

*Some new views on obesity. W. H. LeR.—p. 1328.

Effect of Artificial Modification of Food on Serum Cholesterol. The eight subjects for this study were students in good health who carried on with their regular duties during the experiments. Ingestion of a natural base low-fat diet (less than 4 per cent of calories from fat) for periods of one week or more resulted in striking changes in the pattern of the circulating lipids. Total cholesterol fell approximately 20 per cent, but the lipoprotein cholesterol increased disproportionately. Serum triglycerides increased substantially. The incorporation of corn oil, butter, partially hydrogenated blended corn oil margarine or commercial margarine at a level of 40 per cent of calories resulted in every instance in a return of triglyceride levels to control values and a correction of the disturbed lipoprotein ratios. Only corn oil maintained the cholesterol levels at the low point achieved on the low-fat diet. Both a commercial margarine and a specially prepared "corn-oil margarine" resulted in a rise in serum cholesterol from low-fat levels. The data reinforce the view that vegetable oils exercise a neutral effect on serum cholesterol and that the active cholesterol elevating factors may consist of such substances as the short-chain fatty acids in milk fats and the isomers formed by long-chain fatty acids during the hydrogenation procedure.

Diet and Degeneration. Because of the high incidence of degenerative disease in our aging population, the role of nutrition in the etiology and prevention of these conditions warrants investigation. The causal relationship between diet and atherosclerosis is plausible, but the proof is incomplete. In patients with this disease, alteration of the diet may be undertaken under the clinical supervision of the doctor and the dietitian in an attempt to delay progress of the condition and to improve the prognosis. Prophylactic changes in dietary fat are not yet recommended for the entire population. Popular articles have represented the dietary lowering of serum lipids as a simple, established procedure. Actually, it is complicated, difficult, and incompletely understood.

Some New Views on Obesity. The usual concept of fat deposits in the body is that they behave in a relatively inert manner. Many physicians and physiologists are now coming to believe that fat constitutes an adipose organ rather than an inert mass. This adipose organ has much activity and is not merely in a state of suspended animation. It has been shown that half the adipose organ in normal rats and mice is metabolized and reconstituted in the very short period of five to nine days. Transposing the figures directly to man, or rather to woman, we find that a normal woman of about 132 lb. at the age of forty, would be forming and destroying more than 3 lb. of fat every 24 hr. Studies in Britain have shown that if patients are placed on a daily 1000-calorie diet, given as 90 per cent fat, or 90 per cent protein, or 90 per cent carbohydrate, most weight is lost on the high-fat diet, almost as much on the high-protein diet, but considerably less on the 1000-calorie carbohydrate diet. Some patients gained weight on the 1000-calorie carbohydrate diet. It would appear that patients would lose weight more rapidly if placed either on a low-calorie diet containing high proportions of fat or high proportions of protein.

CIRCULATION

Vol. 23, January, 1961

*Dietary fat and its relation to heart attacks and strokes. Report by the Central Committee for Medical and Community Program of the American Heart Association.—p. 133.

Dietary Fat and Heart Attacks. This is a report by an *ad hoc* Committee on Dietary Fat and Atherosclerosis. The following questions are discussed: how atherosclerosis develops, what types of research relate diet to atherosclerosis, what measures reduce the amount of cholesterol in blood, and who in particular should modify the fat content of his diet. It is concluded that the reduction or control of fat consumption under medical supervision, with reasonable substitution of polyunsaturated for saturated fats, is recommended as a possible means of preventing atherosclerosis and decreasing the risk of heart attacks and strokes. More complete information must be obtained before final conclusions can be reached. Appendix 1 contains a list of twenty-three recent scientific references on dietary fat and atherosclerosis. Appendix 2 discusses the different kinds of fat.

DIABETES

Vol. 10, January-February, 1961

*The blood ketone and plasma free fatty acid concentration in diabetic and normal subjects. E. E. Werk, Jr., and H. C. Knowles, Jr.—p. 22.

Blood Ketones and Plasma Free Fatty Acids. Fasting and postprandial blood ketones and plasma free fatty acids (FFA) were measured in a large number of nondiabetic and controlled diabetic patients. Concentrations of ketones and FFA were greater in the fasting diabetic patients. In the postprandial state, ketone but not FFA levels were higher in diabetic than in nondiabetic patients. In nondiabetic patients, postprandial ketone concentrations were significantly less than fasting, but FFA were not different. In diabetic patients the reverse was true. A significant positive correlation was demonstrated between ketone and FFA values, but in general ketone levels were more apt to be increased with normal FFA than the converse. A positive urinary Acetest correlated well with hyperketonemia, but slightly elevated ketone levels were often found with a negative Acetest. It is concluded that the concentration of circulating ketones and FFA are sensitive indices of slightly abnormal intracellular processes in regulated diabetic patients and should be given consideration in striving for

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ENDOCRINOLOGY

Vol. 68, February, 1961

*Comparative effects of glucagon, hydrocortisone and epinephrine on the protein metabolism of the fasting rat. J. L. Izzo and S. R. Glasser.—p. 189.

Glucagon Effects in Protein Metabolism. A study of the mechanism of action of glucagon in causing protein catabolism was recently made by comparing the effects of glucagon and hydrocortisone, using female rats fasted five days. The possible relationship of the level of liver glycogen to protein catabolism was also investigated by comparing the effects of glucagon and epinephrine. Both glucagon- and hydrocortisone-treated animals excreted similar amounts of urinary nitrogen. The glucagon-treated rats lost less body weight, tissue protein, and urinary phosphorus. These and other results suggest that glucagon and hydrocortisone cause protein catabolism by different mechanisms.

FEDERATION PROCEEDINGS

Vol. 19, December, 1960, Part I

*Mechanism of absorption of vitamin B_{12}. V. Herbert.—p. 884.

*Energy. D. S. Moschette.—p. 1011.

*Calcium, phosphorus and magnesium. F. A. Schofield and E. Morrell.—p. 1014.

*Minor minerals and B-vitamins. C. M. Coons and E. Z. Moyer.—p. 1017.

*A long-term feeding study of irradiated foods using rats as experimental animals. L. R. Richardson, S. J. Ritchey, and R. H. Rigdon.—p. 1023.

*A summary of the wholesomeness of gamma-irradiated foods. M. S. Read.—p. 1055.

Vol. 19, December, 1960, Part II

Ascorbic acid in cold acclimation. A. Desmarais.—p. 88.

*Intermediary glucose metablism in the cold acclimatized rat. J. P. Hannon.—p. 100.

Vol. 19, December, 1960, Part III

*A guide to the production, care and use of laboratory animals. J. S. Cass, I. R. Campbell, and L. Lange.

Vitamin B_{12} Absorption. In a recent study, vitamin B_{12} absorption was found to require two substances: (a) an extrinsic factor, supplied outside the body, and (b) an intrinsic factor supplied by the body. The intrinsic factor binds B_{12} first. In the intestine, a receptor or acceptor through a calcium-dependent bond picks up the vitamin B_{12}–laden intrinsic factor and transports it across the intestinal mucosa. Further experimentation with rats and human beings indicated that a species-dependent factor existed for the release of the B_{12} by the intrinsic factor. The ability of the intrinsic factor to bind B_{12} was not species-dependent.

Metabolic Patterns in Preadolescent Children. Energy utilized by the body is defined as the amount of energy available for use after gross food energy has been corrected for losses in urine and feces. Absorption of energy is derived by correcting food energy by the amount excreted in the feces. The relationship between energy intake and requirements seems to be a determining factor in influencing protein metabolism. In a series of recent studies on metabolic patterns in thirty-five pre-adolescent girls, data on energy balance were collected over a wide range of protein intake. Daily energy intake ranged from 1800 to 2600 calories; daily protein intake from 18 to 88 gm. Results of this study indicate: (a) as protein level increased, the percentage of energy retained for body needs decreased from 95 to 92 per cent; (b) a highly significant decrease in urinary energy occurred as nitrogen intake decreased; (c) energy loss through the feces was fairly constant; (d) the estimated energy available for activity and growth was about 23 per cent less on the high-protein diet than on the low-protein diet.

Calcium, Phosphorus, and Magnesium. The effect of a low-protein vs. a high-protein diet on absorption of calcium, phosphorus, and magnesium was studied. Calcium and phosphorus levels were held constant and at the recommended allowance. Thirty-five children were divided into three groups. Protein variation did not affect calcium absorption or excretion. However, phosphorus absorption was higher on the low-protein diet and fecal excretion was decreased, but urinary excretion was higher than for the high-protein diets. High-protein diets reduced absorption and urinary excretion of phosphorus but increased fecal excretion. Magnesium absorption in the high-protein diet was 42 to 44 per cent, and feces excretion was more than half the magnesium ingested. In the low-protein diet, magnesium absorption was 59 per cent of dietary intake.

Minor Minerals and B-Vitamins. A study using seven- to nine-year-old girls for a three-year period demonstrated the effect of a low-protein diet on the metabolism of zinc, manganese, molybdenum, iron, copper, cobalt, thiamine, riboflavin, niacin, folic acid, and pantothenic acid. The low-protein diet reduced the fecal excretion of zinc, manganese, molybdenum, iron, riboflavin, and thiamine. Fecal excretion of folic acid was increased as the protein was reduced. Copper, cobalt, and pantothenic acid excretion figures were inconclusive because a constant level of intake could not be maintained. Niacin excretion was low on the diet containing the highest total nitrogen, tryptophan, and potential niacin, but this may have resulted from the amount of gelatin given to increase the nitrogen content of the diet.

Long-Term Effect of Irradiated Foods. Three long-term irradiation studies have been conducted since 1954, including: (a) the growth and reproduction of rats receiving an irradiated synthetic diet, (b) growth, reproduction, and gross and histopathologic data on three generations of rats receiving various combinations of control and irradiated boned chicken and green-bean diets, and (c) congenital blindness in young from mothers receiving control and irradiated diets. These studies showed that the rats on the irradiated diets grew at a slightly slower rate than the controls, but eventually attained the same weight. In general, growth and reproduction were the same for both groups. Laboratory tests at autopsy showed that irradiated foods did not affect the hematologic or histopathologic situation. There was no significant difference in the weight of the various organs. The incidence of congenital blindness, or microphthalmia, was in some cases higher in groups not receiving the irradiated foods. It was therefore concluded that irradiated foods did not produce blindness or increase its incidence in weanling rats.

Wholesomeness of Irradiated foods. "Wholesomeness" is the suitability of foods for human consumption and includes two subdivisions: potential toxicity and nutritional adequacy. Twenty-two foods, both irradiated and nonirradiated were under investigation for a two-year period, using four animal species, including man. No significant differences were noted between the control and irradiated diets as to effects on growth, reproduction, life span, or disease incidence. It has generally been recognized that irradiation of food does not significantly alter the nutritional value of the macronutrients. Recent data also indicate that small doses of irradiation (2.79 to 5.58 megarads) may improve the utilization of soy bean protein by inactivating the trypsin inhibitor. Higher doses, however, decrease the protein quality. The digestibility of starch was decreased on irradiation, but this decrease was improved by the presence of irradiated fat. Vitamins are destroyed through irradiation in varying degrees, depending on the food. As a result, the adequacy of a mixed irradiated diet was investigated. This diet consisted of many different foods, but all irradiated in the same doses. Consumption of this diet resulted in a marginal deficiency of both thiamine and pyridoxine, even when the diet contained a commercial, non-irradiated bread product.

Intermediary Glucose Metabolism. The manner in which prolonged cold exposure alters certain specific enzyme activities in the glycolytic phase of carbohydrate metabolism was investigated. A rat was acclimatized for about four weeks, after which certain alterations in intermediary metabolism were observed. The intact acclimatized rat formed liver glycogen from ingested or injected glucose at a much greater rate than control animals. Also, acclimatized rats maintained higher fasting liver glycogen stores than controls. The glucokinase activities of both liver and muscle were the highest of all the glycolytic enzymes studied in the acclimatized rat. Hyperthyroidism was associated with an increase in glucose-6-phosphate activity. There was no indica-

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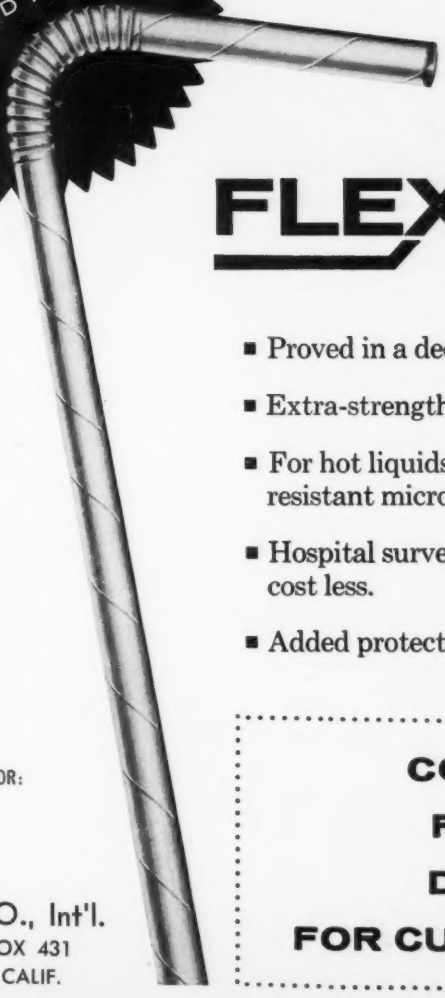

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tion in either liver or muscle that cold exposure altered the specific activity of phosphorylase. Since the liver of the cold-acclimatized rat has an increased gluconeogenic capacity, the animal should be better able to maintain blood sugar levels in the face of a restricted glucose intake, as in fasting.

Annotated Bibliography on Laboratory Animals. Part III of this issue of *Federation Proceedings* is devoted to an annotated bibliography developed by members of the staff of Kettering Laboratory and includes all phases of procurement, production, care, and use of laboratory animals. Emphasis is placed on more recent publications, though earlier articles of interest are included. At the end of each section is a list of cross-references to permit the user to consult related abstracts in other sections.

FOOD TECHNOLOGY

Vol. 14, December, 1960

*The effectiveness of acronize chlortetracycline in poultry preservation following long term commercial use. A. Abbey, A. R. Kohler, and P. F. Hopper.—p. 609.

*The effect of number of judgments in a test on flavor evaluations for preference. L. A. Sather and L. D. Calvin.—p. 613.

*Radiation resistance of the natural bacterial flora of cured ham. W. L. Brown, C. Vinton, and C. E. Gross.—p. 622.

*Instant bread mix: Studies on the dehydration of flavoring materials. C. O. Chichester, N. Sharrah, and M. Simone.—p. 653.

*Instant bread mix: Consumer evaluation of prepared bread. M. Simone, N. Sharrah, and C. O. Chichester.—p. 657.

Vol. 15, January, 1961

*The role of convenience in food selection. R. L. Baker.—advg. p. 10.

*Relationship between pork leanness and moisture content. E. Karmas, J. E. Thompson, and H. E. Wistreich.—p. 8.

*Price vs. marbling in the purchase of pork chops. R. G. Kauffman, R. W. Bray, and M. A. Schaars.—p. 22.

Preservation of Poultry. Acronize remained effective (75 per cent average shelf-life extension) in retarding poultry spoilage after five years of continued commercial use. Acronized poultry held under ice demonstrated an increase (48 per cent average) in shelf-life over control poultry. When poultry was stored in polyethylene bags, an increase (77 per cent average) in shelf-life over the control was noted. The indications are that an increase of insensitive microorganisms in a developing spoilage population on Acronized poultry is probably caused by "selection" rather than "development."

Flavor Evaluation. Canned peaches, hamburger, tomato juice, and green beans were scored for preference by a panel of 175 to 191 untrained flavor judges. Twenty samples of each product were assigned to four trays and judged in one continuous test period. The order of presentation to the judges was assigned so as to have each tray tested in each possible order an equal number of times. It was assumed that the preference differences for the samples on a tray were flavor differences. The judges had a lower ability to detect differences in tomato juice among samples on the first tray than when the same samples were served on succeeding trays. For the other three products, tray order did not significantly affect the judges' ability to discriminate between samples. This indicates that for mild products, such as included in this test, up to twenty samples may be included in one test period with no decrease in the judge's ability to discriminate flavor preferences among samples.

Radiation Preservation. Three experiments were conducted to study the radiation resistance of the natural bacterial flora of canned ham. Most strains were extremely sensitive to irradiation and were destroyed at low levels. Two strains of cocci survived high levels of radiation but were not studied extensively since in commercial processing they would be destroyed with low levels of heat. A few spores survived high levels of radiation in cans of cured ham. If curing salts (salt, sugar, nitrate, and nitrite) were present in normal amounts, ground ham did not spoil in the cans given at least 0.5 megarad irradiation when incubated at 26°C. for two months. The spores were able to grow and produce spoilage through a radiation level of 1 megarad, provided no curing salts were present. Counts after incubation indicated that the cells were increasing in cans of meat containing no curing salts. No marked differences were found in destruction of bacteria between a gamma source and electron beam source of irradiation.

Evaluation of Dehydrated Flavoring Materials. Freeze-, spray-, and drum-drying techniques were successful in producing dried bread-flavoring materials from cell-free liquid broths. Breads made with these mixtures were ranked slightly different in bread flavor intensity and no different in preference by a laboratory panel. These dried materials maintained sufficient storage stability, from the standpoint of observed appearance, color retention, and moisture pickup over two months.

Instant Bread Mix. Instant breads, made with freeze-dried, spray-dried, drum-dried, or liquid flavoring preparations, were evaluated by a laboratory and consumer panel. Comparative ratings of bread flavor and preference by the laboratory panel resulted in the following rank order of the samples: liquid, freeze-dried, spray-dried, and drum-dried. The rank order by the consumer panel was liquid, drum-dried, spray-dried, and freeze-dried. No significant differences were indicated by either panel among the three dried flavor preparations. An over-all consumer rating of the instant breads was 4.65 (between *like slightly* and *neither like nor dislike* on a 7-level structured scale). There were significant age and sex effects on ratings of the instant bread by consumers. The younger and older groups and females rated all samples higher than the middle-age groups and males. Bread eating habits had an apparent effect on the consumers' ratings. The significant differences in loaf volume among the four samples were closely related to the laboratory panel's comparative ratings of flavor intensity and preference and to the consumer panel's response to textural quality.

Convenience in Food Selection. Convenience, one aspect of functional value, plays an important role in food selection. This functional value has become so important in our technically oriented society that homemakers no longer rationalize the use of convenience items. A convenience item is selected without having in mind an alternative use for the time or effort saved. Convenience takes many forms. Decisive factors in selection may be such functional properties as the ease of opening, handling, or storing a package. Examples of these are discussed.

Pork Leanness and Moisture Content. The moisture contents of lean and fat tissues of pork were studied. The relationship between moisture content and leanness of pork was established and expressed by an equation. This equation may be applied for quantitative determination of lean in the meat industry.

Price vs. Marbling of Pork Chops. A consumer acceptance study was conducted to determine the importance of marbling as a factor in selecting pork chops and to ascertain the effect of various price differentials on the purchase of highly marbled vs. nonmarbled chops. There was a definite preference for unmarbled chops among the forty purchasers interviewed. Marbled chops must be reduced considerably in price to induce buyers to purchase the same, and, although the taste reaction to marbled cuts indicated a preference for them over the unmarbled chops, this preference was not carried over to the purchase counter.

GASTROENTEROLOGY

Vol. 40, January, 1961

*Absorption of vitamin B_{12} in man following extensive resection of the jejunum, ileum, and colon. E. Allcock.—p. 81.

Site of Vitamin B_{12} Absorption in Man. Two groups of patients who had extensive intestinal resections were studied to ascertain the rate of absorption of vitamin B_{12}. In those with a normal ileum, absorption was normal, as shown by normal fecal and urinary output. In patients who had had the ileum resected, there was excessive loss of vitamin B_{12} in the feces and a small loss in the urine. It was concluded that the ileum is the site of absorption of vitamin B_{12}. Malabsorption and macrocytic anemia would result if there is total loss of the ileum.

GERIATRICS

Vol. 16, January, 1961

*Max Rubner on aging. A. Lautz.—p. 44.

Max Rubner on Aging. Max Rub-

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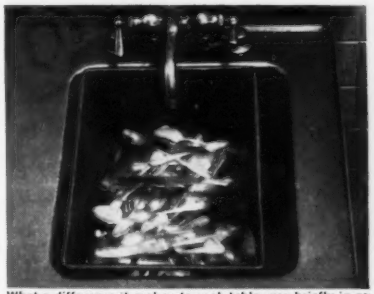

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ner (born in Munich in 1854; died in Berlin in 1932) was head of the Department of Hygiene, University of Berlin. He is known for his contributions to the basic principles of physiology and body metabolism. It was he who discovered that energy in basal metabolism is proportional to the surface area of the body, that the specific dynamic action of food nutrients in metabolism is greatest for protein and least for carbohydrate, and that 10 per cent loss of body water is serious and 20 per cent usually fatal. His book, *The Battle of Man for Life*, published in 1929, contains much of geriatric interest. Described here are his comments on physical aging (and the need for continued physical exercise); nutrition, heart, and blood vessels (the problems of loss of appetite, loss of teeth and chewing ability, and poor nutrition related to inadequate physical activity are pointed up); intellect, memory, creative genius, and maintenance of intellectual function.

I.C.R.S. MEDICAL REPORTS

Vol. 2, July-September, 1960, Supplement

*Bibliography of selected articles by authors who have been associated with The Institute of Nutrition, USSR.

Bibliography of Russian Literature. This fifteen-page bibliography was compiled from the extensive file on the Soviet biomedical sciences maintained by the Institute of Contemporary Russian Studies, Fordham University. Listings are alphabetical according to authors' names, as nearly as possible in view of the difference between the Russian and English alphabets.

JOURNAL OF AGRICULTURAL AND FOOD CHEMISTRY

Vol. 9, January-February, 1961

*Amino acid composition of twenty-seven selected seed meals. C. H. VanEtten, R. W. Miller, I. A. Wolff, and Q. Jones.—p. 79.

Amino Acid Composition of Seed Meals. Seed meals obtained from twenty-seven genera of thirteen botanical families were analyzed for their acid-stable amino acid content by an ion exchange chromatographic method and for tryptophan by another method. Comparison of the amino acid compositions with the requirements for optimum growth of the rat and the chick showed some of the seed meals to be well balanced. The majority were deficient in methionine-cystine, lysine, or both.

JOURNAL OF THE AMERICAN MEDICAL ASSOCIATION

Vol. 175, January 7, 1961

*The unhappy fat man. Letters to the Journal.—p. 66.

Vol. 175, January 14, 1961

*The amino acid requirements of infants. L. E. Holt, Jr., and S. E. Snyderman.—p. 100.

*Differences between cow's and human milk. H. H. Williams.—p. 104.

*Protein allowances for premature infants. H. H. Gordon.—p. 107.

*Protein requirements of full-term infants. C. W. Woodruff.—p. 114.

*Iron requirements in infancy. I. Schulman. —p. 118.

*Obesity and calorie bookkeeping. Letters to the Journal.—p. 160.

*Biblical reason for forbidding use of milk and meat. Letters to the Journal.—p. 163.

*Tapeworm. Questions and Answers.—p. 174.

Vol. 175, January 21, 1961

*Mineral sea salts. Questions and Answers.—p. 265.

Vol. 175, January 28, 1961

*Lithium salts. Questions and Answers.—p. 340.

*Preventing amebiasis. Questions and Answers.—p. 342.

Vol. 175, February 4, 1961

*"Wear and tear" protein. Letters to the Journal.—p. 414.

Unhappy Fat Man. It is argued here that the law of the conservation of energy, proved to be applicable to human energy exchange, would be contradicted if one were to go along with the theory that "not all obese people are hyperphagic; quite a few are euphagic or even hypophagic." Can subjects eating normally and those eating less be equated with those who are in caloric equilibrium or even in negative caloric balance? Another contended statement regards water retention as a common cause of obesity. Studies are cited which indicate that no abnormal accumulation of water occurs during obesity.

Amino Acid Requirements of Infants. Data are presented on all the essential amino acids. Only natural L-forms of amino acids were employed; unessential amino acids were used in approximately the proportions found in human milk; introduction of a great excess of non-essential nitrogen was avoided. It was found that, unlike the adult, the infant requires histidine in his diet (this demand is confined to the first few months of life). Arginine was not found to be essential. On the basis of body weight, the infant's requirements for essential amino acids are far higher than those of the adult.

Differences between Cow's and Human Milk. Tables are included to compare the two types of milk for gross composition, energy distribution, ash components, fatty acids, "essential" fatty acids, fat-soluble vitamins, water-soluble vitamins, protein, nitrogen, indispensable amino acids, and sulphur-containing amino acids.

Protein Allowances for Premature Infants. Extra-uterine rates of weight gain and nitrogen retention approximated calculated intra-uterine rates when cow's milk mixtures were given in which protein supplied 16 to 20 per cent of the daily calories (4 to 6 gm. protein, 100 to 120 calories per kilogram body weight). Advantages of this liberal intake of protein in the cow's milk mixture far outweighed the disadvantages, particularly for smaller premature infants.

Protein Requirements for Infants. Although the protein requirements of full-term infants have not yet been determined, feeding regimens providing protein in the form of human and cow's milk have been successful. Growth curves are illustrated; nitrogen retention is discussed. The importance of the total adequacy of the diet is stressed.

Iron Requirements in Infancy. Iron supplementation is necessary for all premature infants. Changes in hemoglobin concentration are charted; tables are included on iron requirements and on iron content of typical infant foods. All but superiorly endowed, well nourished term infants are in jeopardy of iron deficiency.

Obesity. It is pointed out that emotions do play a major role in the weight problems of some obese patients. Furthermore, patients' claims that they are "not eating a thing" cannot be taken at face value. Rebuttal to these statements includes objection to the recurrent fad of overemphasizing the psychologic basis of overweight. Patients, who, under supervision, do not lose weight on radical reduction of caloric intake may have metabolic abnormalities. A study of 200 such cases is cited.

Biblical Laws on Milk and Meat. Previous comments have apparently skipped over an obvious explanation for forbidding the use of milk and meat in the Bible, i.e., the occurrence of Brucella. The early nomads must have noted the train of events which followed the ingestion of Brucella-laden bovine milk and meat.

Tapeworm. Reinfection with tapeworm may be avoided by: (a) sanitary disposal of human excreta to prevent infection of cattle; (b) the inspection of meat; (c) the storage of beef in the freezer at —10°C. (14°F.) for six days to kill the larvae; and (d) heating of beef to 65°C. (149°F.) before eating (the thermal death point of the cysts embedded in the beef muscle is 56°C. (132.8°F.).

Mineral Sea Salts. The claims of the value of a commercially prepared mineral sea salt are typical of those made by food faddists regarding minerals in our diet. The average mixed American diet contains adequate amounts of vitamins and minerals. The importance of such minerals as iodine, copper, and iron in our diet has been demonstrated, but except for iodine and iron, it is not possible to demonstrate a deficiency.

Lithium Salts. Lithium salts have no therapeutic uses, as the ion is toxic. Lithium does not promote water retention and edema formation. This fact, plus the similarity in taste between the chlorides of lithium and sodium, led to the use of lithium as a salt substitute. It is no longer used, as a number of patients died after receiving it. The principal toxic action of lithium appears to be on the kidney.

Preventing Amebiasis. Studies have shown that eight parts of elemental iodine per million parts of water will destroy amebic cysts within 10 min. This dose of iodine is best achieved with tablets of tetraglycine hydroperiodide (Globaline). A 20-mg. tablet in a quart of ordinary contaminated water will produce in 10 min. a safe, palatable water. Destruction of resistant cysts by Halazone has not been dependable because the chlorine is in the form of chloramine rather than

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METHOD—

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2. Heat drippings until melted but not smoking
3. Remove from fire and add flour and stir until smooth
4. Add scalding liquid slowly — stirring well to keep smooth and lump free
5. Cook until smooth and thick
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the much more active hypochlorite ion. Much of the hazard of amebic infection from water lies in the water used to moisten green vegetables. Soaking in high concentrations of chlorine or heat treatment will effectively reduce or eliminate the contamination in vegetables.

"Wear and Tear" Protein. Comments are made in these two letters concerning protein metabolism in chronic nephritis. It is pointed out that "wear and tear" protein is not scientific terminology but rather a figure of speech, and the amount of protein does not refer to an irreducible minimum with a diet which contains any protein. It has been shown that after twelve to twenty days on a Borst diet (almost no protein), patients did have a slow reduction in nitrogen excretion, indicating a diminution in protein breakdown and an increase in protein-sparing action (probably mostly by carbohydrate). A protein-free diet would be of value in cases of acute renal failure but not in chronic cases, except in brief acute exacerbations.

THE JOURNAL OF CLINICAL INVESTIGATION

Vol. 40, January, 1961

Effect of steroids on water diuresis and vasopressin sensitivity. R. D. Lindeman, H. C. Van Buren, and L. G. Raisz.—p. 152.

*The effect of 2-deoxy-D-glucose infusions on lipid and carbohydrate metabolism in man. J. Laszlo, W. R. Harlan, R. F. Klein, N. Kirshner, E. H. Estes, Jr., and M. D. Bogdonoff.—p. 171.

Lipid and Carbohydrate Metabolism in Man. A competitive inhibitor of glucose metabolism, 2-deoxy-D-glucose (2-DG), was administered intravenously to fasting, rested subjects. Plasma levels of free fatty acid (FFA), glucose, and lactate increased markedly. Insulin, glucose, and fructose reversed the rise in plasma FFA but did not alter plasma lactate levels. Lactate infusion did not alter the FFA or glucose response to 2-DG. Insulin also reversed the glucose rise following 2-DG but not the clinical side effects. Marked increases in urinary excretion of epinephrine accompanied and followed the infusion of 2-DG and suggest that the mechanism mediating the plasma FFA response may involve the adrenal medulla. Infusion of 2-DG in the fasting individual may provide a technique for making a quantitative estimate of the magnitude of net glucose release in man.

JOURNAL OF DAIRY SCIENCE

Vol. 43, November, 1960

Facts, fallacies, and conflicts affecting the demand for dairy foods. Symposium. W. D. Knox.—p. 1669.

*Relationship to specific diseases. Z. E. Anderson.—p. 1670.

*Adulterants in milk and milk products. M. R. Stephens.—p. 1678.

Relationship to Specific Diseases. The author examines some of the charges made by food faddists and others implicating milk as a contributing factor in certain diseases. Allergies to milk are more often suspected than proved. Some studies indicate that the incidence is in the order of 1 per cent in babies under two years. If the sensitizing protein is lactalbumin, the allergenic property is reduced or destroyed by heat, as in sterilized milks. The practice of some pediatricians of feeding vegetable-protein substitutes to all babies in families which manifest allergies is ill-advised because of the difficulty of providing adequate nourishment when milk is withheld . . . Much remains to be learned as to the exact relationship between dietary lipids, serum cholesterol, and vascular disease. Recently it has been observed that babies fed human milk show higher serum cholesterol values than those fed on cow's milk formulas. Also, on formulas where the milk fat has been substituted by vegetable oils, cholesterol levels are still lower, and comparable to those of babies suffering from protein malnutrition . . . Under rare conditions it is necessary to withdraw milk from the diet completely. In galactosemia, the subject is unable to metabolize galactose. Here, milk of all species must be excluded . . . On the positive side, the author cites the numerous occasions where milk in the diet is next to imperative, such as producing optimal growth and tissue development in children, and in treating kwashiorkor; so far no combination of plant proteins has been found as effective as milk.

Antibiotics and Pesticide Residues. All packages of antibiotics and pesticides used by farmers bear label instructions approved by the Food and Drug Administration which, if strictly followed, should yield food products without illegal residues. For the protection of the consumer, FDA is continually checking samples of foods likely to be contaminated. It also assists other government agencies and business groups in educational programs directed to farmers and food processors relative to the problem . . . FDA admits the necessity of allowing "tolerances" in the order of a few parts per million for those substances, not harmful to the human race, as they occur in certain foods. There are some pesticides which the Administration has ruled should not be present in foods even in trace amounts . . . FDA also administers the Food Additives law which permits the processor to add certain substances demonstrated to be harmless and safe to make the foods more attractive to the consumer. A number of such "additives" have been officially approved.

JOURNAL OF HOME ECONOMICS

Vol. 53, January, 1961

*World view of nutrition. W. D. Brewer.—p. 15.

*A nutrition education program in Colombia, South America. J. Vannoy.—p. 29.

World View of Nutrition. This report of the Fifth International Congress on Nutrition indicates that one of the basic contributions of the Congress was the evaluation of the status of nutrition information and the identification of areas where the need for research is urgent. What is the range of intake of nutrients to which the human body can adapt without loss of health? The importance of breast-feeding and the factors affecting lactation were highlighted. Health education should attempt to eliminate cultural customs which have ill effects but to incorporate other practices so the cultural pattern is retained. Food sources of good quality protein are needed in short-term planning (one vegetable-protein mixture, Incaparina, has been used successfully in Central America). Proceedings of the Congress will be a helpful reference in courses in advanced nutrition.

Nutrition Education in Colombia. Through the cooperation of the Foreign Agricultural Service of the USDA, a nutrition program has been in operation in Colombia, South America, for three years. Surveys showed that all nutrients except ascorbic acid appeared to be in short supply. Elementary public school teachers were shown how to make inexpensive demonstration materials and how to conduct several classes on nutrition which were integrated with other subjects. Television, radio, newspapers, the bakers' magazine, supermarket demonstrations, and various group meetings were used in nutrition education. In addition, CARE distributes a school lunch to 92,000 children in Bogota and 48,000 in Medellin; it consists of a 50-gm. roll and a cup of reconstituted milk, six days a week. A decrease in signs of vitamin deficiency has resulted and students are healthier, as evidenced in better school attendance. Within the three-year period, the consumption of wheat foods has almost doubled, and a foreign market for one of the surplus commodities of the U.S. has been increased.

JOURNAL OF THE INDIAN MEDICAL ASSOCIATION

Vol. 35, November 16, 1960

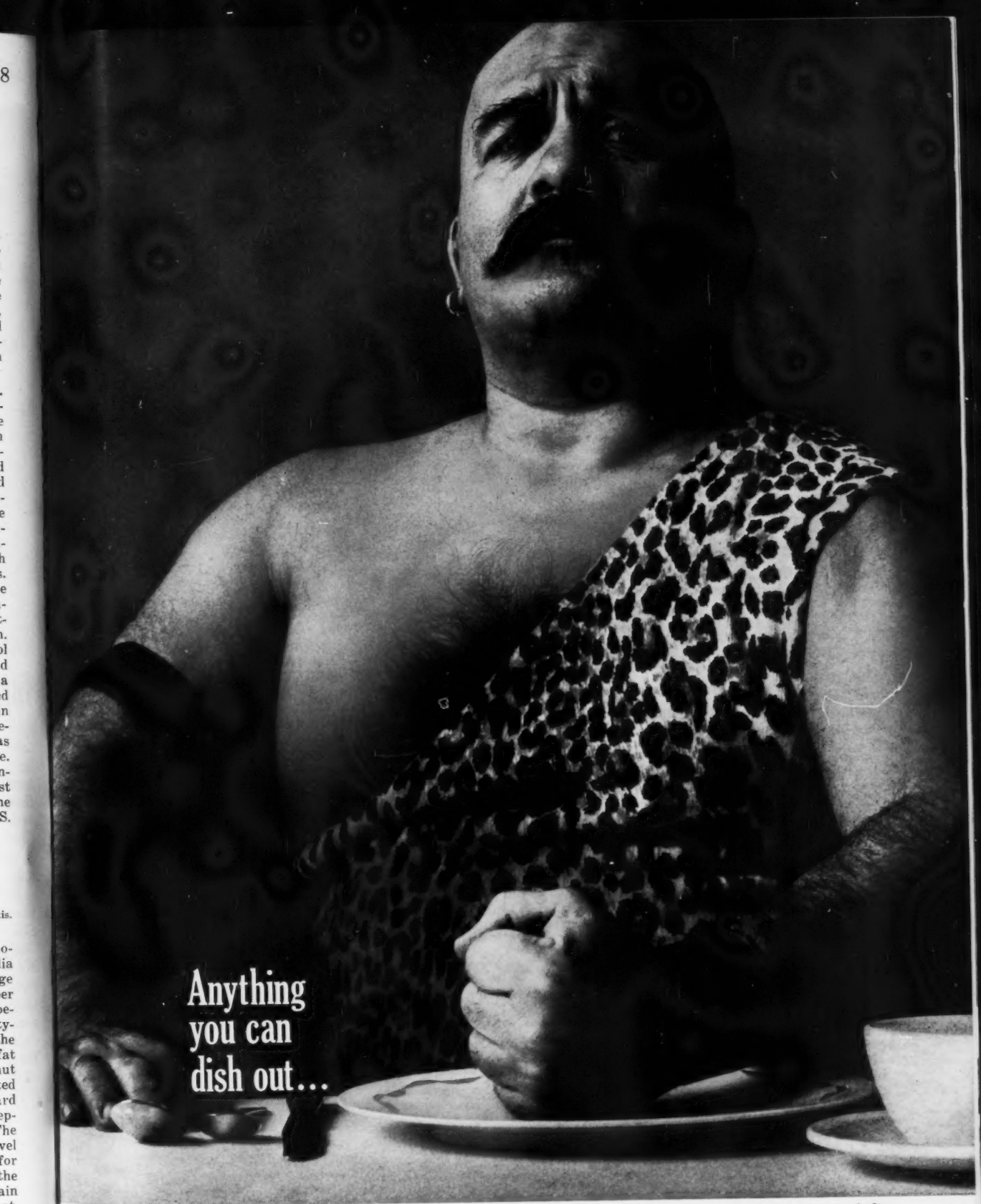
*Serum cholesterol studies among Gujratis. D. N. Shukla and B. A. Sayed.—p. 441.

Serum Cholesterol. The serum cholesterol levels of 169 adults in India were observed. The normal range varied from 111.4 to 371.8 mg. per 100 ml. A sharp rise was noted between the ages of twenty and fifty-nine years. The relation between the serum cholesterol and dietary fat intake (in the form of groundnut [peanut] oil, til oil, hydrogenated vegetable oil, coconut and mustard oils, pure ghee, and milk and its preparations) was not significant. The slightly high serum cholesterol level in this study may be accounted for partly by the low lecithin level in the diet (the Gujrati diet does not contain such items as eggs, fish, and meat, rich in lecithin).

THE JOURNAL OF NUTRITION

Vol. 73, January, 1961

Endogenous hypercholesterosis in rabbits fed a fat-free purified diet and the effect of unsaturated lipid. E. R. Diller, M. Kor-



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zenovsky, and O. A. Harvey.—p. 14.
Conjoint effects of dietary vegetable fats and cholesterol in rabbits. J. L. Beare, H. C. Grice, and C. Y. Hopkins.—p. 17.
*The use of nitrogen to creatinine ratios in random urine specimens to estimate dietary protein. R. C. Powell, I. C. Plough, and E. M. Baker, III.—p. 47.
Effect of a pyridoxine deficiency on cold-adjusted rats. D. A. Vaughan and L. N. Vaughan.—p. 53.
*Tryptophan metabolism in human subjects. G. P. French and A. W. Wertz.—p. 57.
The requirement and tissue distribution of magnesium in the rat as influenced by environmental temperature and dietary calcium. D. M. McAleese and R. M. Forbes. —p. 94.

Dietary Protein from Random Urines. The use of nitrogen/creatinine ratios (grams of nitrogen per gram of creatinine) was observed in random urine samples to estimate dietary protein. The accuracy of 3-, 4-, and 5-hr. measurements of urinary nitrogen excretion was compared with nitrogen: creatinine ratios determined from the same samples in the prediction of nitrogen intake. Although 24-hr. urinary nitrogen gave the best correlation, little difference in results was found when comparing 4-hr. samples with the ratios. Difficulties from diurnal variation of nitrogen excretion were reduced by the use of ratios, but the variability in creatinine excretion among individuals raised other problems. It is concluded that for surveys of large groups, the use of nitrogen: creatinine ratios in random urine samples to estimate protein intake merits further consideration.

Tryptophan Metabolism. The effect of the ingestion of different amounts of tryptophan on the concentration of this amino acid in the plasma and blood cells and on the rate of its excretion in the urine was investigated. The concentration of tryptophan in the plasma and blood cells increased after the ingestion of tryptophan. At the maximum concentrations, the amount of unbound tryptophan circulating in the plasma and cells in excess of that circulating before ingestion of the dose was about 14 to 15 per cent of the dose, regardless of the size of dose. The amount of unbound tryptophan recovered in the urine in the 24 hr. following the dose represented 0.5 per cent or less of the dose. The data indicated that, as the load filtered at the glomerulus was increased, the amount of tryptophan reabsorbed by the renal tubules increased. The percentage re-absorbed remained practically the same for the different filtered loads.

THE JOURNAL OF PEDIATRICS

Vol. 58, January, 1961
*"Solubilized" vitamin K_1 (phytonadione) in neonatal hypothrombinemia. M. Shoshkes, M. Willner, G. Pontoriero, and R. Chiong. —p. 27.

Vitamin K_1 in Neonatal Hypothrombinemia. Solubilized vitamin K_1 (phytonadione) was administered to 300 infants during the first day of life; 178 received 2 mg. orally via a specially designed disposable, sterilized plastic ampule, and 122 received 1 mg. intramuscularly. Capillary whole blood prothrombin times in all of the infants and serum bilirubin levels (both indirect and total values) in a portion of them were determined within the subsequent 72 hr. of life and compared to those of controls. Two of the fifty-two control infants, however, had prolonged prothrombin times. The prothrombin times of all infants in the vitamin K_1-treated groups were within normal limits, and no bleeding tendencies were noted. No untoward reaction to either method of administration of vitamin K_1 were encountered.

THE LANCET

No. 7167, January 7, 1961
*The influence of diet on serum-triglycerides. A. Antonis and I. Bersohn.—p. 3.

Influence of Diet on Serum Triglyceride. White and Banto subjects, when habituated to a particular diet, had fasting serum-triglyceride levels not significantly different, the composition of the fatty acid components being almost identical. Furthermore, both groups responded in the same way to dietary manipulation. After habituation to a low-fat diet, the consumption of a high-fat diet rich in monoenoic and saturated fatty acids for a year resulted in a significant rise of previously low serum-triglyceride levels. Change from high-fat to low-fat diets also produced significantly temporary increases of serum triglyceride levels, which only returned to base levels after three to six months. Fatty acid composition of fasting serum triglyceride strongly resembled that of the dietary fat. It is suggested that the nature and proportion of dietary fat may influence the rate of clearance of triglycerides from the blood stream, thereby affecting fasting (residual) serum triglyceride levels.

METABOLISM

Vol. 10, January, 1961
*Renal excretion of water, sodium and potassium in cirrhosis of the liver. A. Rivera, J. C. Pena, C. Bárcena, S. Rangel, and F. Dies.—p. 1.
*Prevalence of diabetes among different ethnic Jewish groups in Israel. A. M. Cohen.—p. 50.

Renal Excretion in Cirrhosis. In cirrhosis, the excretion of water is extremely variable. The cirrhotic patient with ascites goes through periods in which the excretion of sodium is scanty, and others in which it is within normal limits. The metabolism of water, sodium, and potassium apparently varies with different stages in the evolution of the disease. Three pathogenetically different stages were observed. In Stage I (first two days), there was no free water excretion; sodium and potassium excretion was scanty and ascites fluid accumulated rapidly. In Stage II (two to twelve days), sodium excretion continued to be scanty, but that of potassium increased and free water appeared; body weight was stable. In Stage III (after twelve days), excretion of sodium, potassium, and water was normal and proportional to intake.

Prevalence of Diabetes in Jews. During 1958-59, a survey was made in Israel of 15,958 Jews to determine the prevalence of diabetes. The subjects were divided into four ethnic groups, according to their country of origin. Two groups were further divided as to length of time settled in Israel. The groups settled for twenty-five years or more ago showed a significant rise in the prevalence of diabetes. Results were compared with surveys conducted by the same method on non-Jews in various parts of the world. The assumption in the literature that diabetes is more common among Jews than non-Jews is contradictory to the findings of this study. Stress was placed on the effect of a change in environmental conditions on the manifestation of diabetes.

NATURE

Vol. 188, December 31, 1960
*Role of cereal fat in the production of nutritional disease in pigs. B. Thafvelin.—p. 1169.

Nutritional Disease in Pigs. Studies were conducted with pigs to find the relationship between dietetic liver necrosis, muscular dystrophy and allied lesions, and the natural fat of grain fed to them. Chemical studies on the properties of cereal fat under various conditions of storage and growth have indicated that a relationship exists. It has been shown that grain can, in certain circumstances, contain unstable fats with a tendency toward becoming rancid. Lesions were produced in the animals when this grain was fed to them. Through heating, the fat was stabilized and the lesion-producing properties of the grain were lessened.

NEW ENGLAND JOURNAL OF MEDICINE

Vol. 264, January 26, 1961
*Nutrient content of beers and ales. C. S. Davidson.—p. 185.

Nutrients in Beers and Ales. Two ranges for nutrient content of beer are given: that culled from the literature (mostly British, French, and American) and a range for American brews when available. A rough mean is given. A 12-oz. bottle or can (360 ml.) is calculated as follows: calories, 158; protein, 1.1 gm.; alcohol, 14 gm.; sodium, 25 mg.; traces of some other minerals and minute amounts of the B-vitamins. The author notes that the sodium content of 12 oz. would be significant in diets severely restricted in sodium.

NUTRITION

Vol. 14, Winter, 1960
*History, organization and development of the profession of dietetics in France. J. Farquet.—p. 154.
*The evolution of dietary habits in the West Indies. L. Horne.—p. 158.
*Diets in psychiatric research. J. L. Crammer. —p. 163.
Tropical sprue. S. Bell.—p. 166.

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*Calcium balances and calcium metabolism. A. M. Parfitt.—p. 170.
*Energy expenditure and calorie intake of an undergraduate expedition. I. F. G. Hampton.—p. 174.

Dietetics in France. Dietetics is a very new field in France. Most of the dietary departments were created under the impetus of a physician. The effect of these departments was often limited, at first, to a special department of medicine or surgery, but little by little they extended to the whole hospital. In 1951, the Ministries of Education and Health became interested in this new profession, and on December 30, 1952, they created a new diploma, "Brevet de Technicien in Dietetique." At present, there are about 150 qualified dietitians in France; twenty to forty qualify each year. In this paper, the training of the dietitian in France, post-graduate studies, and functions of dietitians in France are outlined.

Dietary Habits in the West Indies. This article, by a nutrition officer in Trinidad and Tobago, traces the evolution of dietary habits in the West Indies. The dominant cultural pattern may be Spanish, English, French, or Dutch or a mixture of them all. Several nationals, including African, East Indians, and Chinese, were introduced to the islands as slave labor. Other contributing factors to dietary habits are the adoption of certain American foods and the influence of local products. Hence, West Indian taste for food is as diverse as the people. Several recipes of typical dishes are given.

Diets in Psychiatric Research. There has been a new impetus to psychiatric research of a pharmacologic and biochemical nature, in which metabolic balance studies, the use of constant diets and of special therapeutic diets has an important part to play. There is scope for the development of more palatable and varied diets, which mental patients may be required to eat for several months during an investigation. While dietitians and diet kitchens are absent from mental hospitals and laboratory facilities are rudimentary, there is a place for centrally prepared and packed ready-to-use diets. Investigations of this kind need to be made on a wide scale by methods already worked out.

Calcium Balances and Metabolism. This paper from the metabolic research unit of an orthopedic hospital describes how calcium balance studies are carried out. The need to measure fecal excretion is responsible for much of the difficulty in calcium balance studies. Balance studies are complementary to measurements of turnover rates with isotopes, and the two methods applied simultaneously provide useful information. The role that calcium plays in physiologic processes is also discussed.

Energy Expenditure and Caloric Intake. A survey of the diet and energy expenditure by a member of the 1957 North Sweden Research Group, which took part in an expedition within the Arctic Circle, was carried out to determine the usefulness of a physiologist on undergraduate expeditions. Average expenditure was 3766 calories per day, and the average nutritional balance was +399 calories per day. There was no day-to-day correlation between caloric intake and expenditure, but a relationship of expenditure to intake one or two days later was recorded. The project illustrates that, on undergraduate expeditions, simple but useful physiologic studies can be successfully carried out.

NUTRITION REVIEWS

Vol. 19, January, 1961
*Nutrition: the forgotten art. D. B. Stone.—p. 1.
*Zinc metabolism in Laennec's cirrhosis.—p. 4.

The Forgotten Art. Knowledge has far outstripped practice in the field of nutrition. Obesity, diabetes mellitus, and food faddism are examples of problems about which much is known. Observations emphasize that weight-reducing programs are sometimes harmful and usually ineffective; a disturbing number of diabetic persons are poorly regulated; and food quackery is a half-billion-dollar business which catches more than ten million American food faddists. People are needed with intellectual and technical competence to translate and teach.

Zinc Metabolism in Cirrhosis. A conditioned deficiency of zinc in patients with postalcoholic cirrhosis has been noted. Studies of zinc concentration were made in serum, in urine, and in samples of liver obtained at autopsy from normal controls and from patients with Laennec's cirrhosis. Supplementation of the diet with physiologic quantities of zinc resulted in disappearance of zincuria. Zinc has not previously been regarded as important in the pathologic biochemistry of postalcoholic cirrhosis. Further physiologic and biochemical investigations are needed, since it is possible that a primary cause of the low serum concentrations, the zincuria, and the low tissue zinc concentrations may lie in an alteration in the clearance of zinc by the kidney.

PROCEEDINGS OF THE SOCIETY FOR EXPERIMENTAL BIOLOGY AND MEDICINE

Vol. 105, December, 1960
*Comparison of "meal eating" and "nibbling" on severity of alloxan diabetes. C. Cohn and D. Joseph.—p. 575.

Effects of Eating Patterns on Diabetes. The relationship of eating habits to glycosuria and nitrogen excretion was determined in experiments with alloxanized rats, receiving protamine zinc insulin. The food intake and urinary excretion of glucose and nonprotein nitrogen were measured daily with *ad libitum* feeding. The rats were then adapted to force-feeding and fed in this manner twice daily the same quantity of food as previously eaten. Under conditions of constant insulin dosage with forced-feeding, glycosuria increased by 215 per cent and nonprotein nitrogen excretion by 23 per cent. These same results were demonstrated when animals were put through *ad libitum*-force-feeding cycles two or three times. Thus eating patterns, not ebb and flow of severity of diabetes, were responsible for the findings.

SCIENCE

Vol. 133, January 13, 1961
*Estimation of total body fat from potassium-40 content. G. B. Forbes, J. Gallup, and J. B. Hursh.—p. 101.
*Effects of amino acid feedings in schizophrenic patients treated with iproniazid. W. Pollin, P. V. Cardon, Jr., and S. S. Kety.—p. 104.
Vol. 133, February 3, 1961
*Painless killing of crabs and other large crustaceans. G. Gunter.—p. 327.

Body Fat Content. Interest in obesity has resulted in attempts to assess the actual fat content of the body. Methods now in use include measurement of total body water and body density and measurements of skin-fold thickness. A new approach, described here, is the use of whole-body potassium content as an index of lean body mass. Fifty subjects were assayed for potassium-40 in a whole-body scintillation counter. Results showed good correlation with skin-fold thickness and weight: height ratio as indices of fatness. The procedure has the advantage of being nontraumatic and devoid of hazard to the patient.

Amino Acids for Schizophrenic Patients. The effects of large quantities of certain amino acids (given four to five times daily for one week) on a group of twelve chronic schizophrenic patients are reported; nine also received iproniazid to increase tissue concentrations of endogenous amines. None had received somatic therapies for eighteen months. Marked behavioral changes occurred with administration of L-methionine plus iproniazid to some of the patients. Changes were noted also during tryptophan administration. Other amino acids did not alter behavior in a manner detectable clinically.

Painless Killing of Large Crustaceans. This report describes an easy and painless way to kill large crustaceans, which depends on the simple fact that most aquatic organisms can withstand very little heat. Customarily, large crustaceans used for food are scalded to death. This is unnecessary torture, for it can be avoided easily. It is possible to kill the animals quickly, without pain, by placing them in cool fresh water and raising the temperature steadily to about 40°C.

SURGERY, GYNECOLOGY & OBSTETRICS

Vol. 112, February, 1961
*Twenty-four years of experience with elective gastric resection for duodenal ulcer. H. D. Harvey.—p. 203.

Gastric Resections for Duodenal Ulcers. A survey was made of the different types of gastric resections used over the past twenty-four years in one

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TOMATO FISH FRY ITALIANA

Combine tomato sauce, such as Hunt's, with a little water and horseradish (optional). Dip fish fillets in sauce, then in seasoned bread crumbs (dill is delicious). Chill. Deep fry in Heavy-Duty MFB at 350°. Sprinkle with Parmesan cheese and chopped parsley.

DEEP FRIED HAM KABOBS

Cube ham ends or lunch meat. Place on skewers alternately with pineapple chunks and green pepper squares. Roll in seasoned flour or bread crumbs. Then dip in egg beaten with a little water. Roll again in seasoned bread crumbs with a little dry mustard added. Chill. Deep fry in Heavy-Duty MFB at 350° until golden brown.

GINGER FRIED CHICKEN LEGS WITH ORANGE SAUCE

Steam chicken legs 20 minutes. Cool. Dip in batter of 2 cups flour, ¼ cup sugar, 2 tablesp. salt, 1 tablesp. ground ginger, 1½ teasp. white pepper, 3 tablesp. Wesson and about 2 cups milk, chicken stock or water. Deep fry about 5 minutes in Heavy-Duty MFB at 350°. Serve with *Orange Sauce*. Combine ¼ cup Kneedit Margarine or Wesson Oil, 3 tablesp. cornstarch, 1 quart orange juice, 1 tablesp. grated orange peel, 1 teasp. each salt and ground ginger. Heat mixture, stirring until thickened.

NOTE:
Use eye- and taste-appeal of garnishes and sauces to beat your competition . . . or to up your tab. Try hot mustard, fancy pickles, spiced peach, crab apple, kadota fig . . . sauces such as sweet-and-sour, fruit, or seasoned white.

hospital. From 1936 to 1948 the extent of resection usually did not exceed 50 per cent of the stomach; from 1948 to 1953, resection of at least two-thirds to three-fourths was common; then 1954 to 1957, there was a return to the practice of resecting 50 per cent or less. Significantly, a correlation was found between resections of over 40 to 50 per cent and the incidence of severe dumping and nutritional difficulties. Such surgery did not necessarily lessen the incidence of marginal ulcers. A resection of about 40 to 50 per cent or less of the stomach and a sub-diaphragmatic vagotomy is recommended for best results.

ADULT LEADERSHIP

Vol. 9, January, 1961

*"The next human nature," R. J. Blakely.—p. 204.

The Next Human Nature. Can mankind survive? The thesis presented here is that human nature must transcend itself. The mystery of the relations between mind and matter is expounded. The problems of an industrial society and government are indices that man must know what he wants to do. Education is the only instrument available. In the next two decades, men will continue to educate themselves for change, and they will educate their children in the same philosophy. Continuing education will be carried on through the cooperative efforts of educators and leaders in other areas of national life; leadership will come chiefly from the universities. Those who strive to help men and women broaden, deepen, and extend their understanding and knowledge of the world and to discover and develop themselves do a work essential to survival with freedom.

AMERICAN RESTAURANT

Vol. 45, January 1, 1961

*Conveniently profitable—packaged foods.—p. 29.

Vol. 45, January 15, 1961

*Pre-mixing more quality, control, sales into restaurant baked goods.—p. 21.

*Sweet rolls easy to make. G. L. Wenzel.—p. 31.

*Food production tools and the part they play in greater efficiency. T. Greer.—p. 43.

Frozen Packaged Foods. Frozen gourmet entrées which need only to be heated in their own packages are increasingly popular for restaurant use. For preparation of the individually packaged frozen items, deep-fat fryers are being filled with water instead of fat, because of the fast recovery of the equipment in connection with the use of frozen foods. Twenty gourmet items are listed and described, including cafe au vin rouge with wild rice pilaf, chicken paprikash with egg barley, and stuffed cabbage rolls with sweet and sour raisin sauce.

Pre-Mixed Baked Goods. Pre-mixes allow smaller operations without skilled pastry workers to provide fresh hot rolls and muffins, cakes, and pies. Six steps in making muffins from a mix are pictured, and hints are included for the better baking of soft rolls, gingerbread, cookies, cakes, and icings. A number of quantity recipes are given for muffins, biscuits, rolls, coffee cake, oatmeal cookies, and easy muffin variations. A recipe for a basic muffin mix is also presented.

Easy Sweet Rolls. A recipe for sweet rolls with date filling and apricot glaze is given. It is suggested that a senior citizen or handicapped person be hired, part-time, to prepare baked goods. Various cost break-downs are given, depending on who does the baking.

Food Production Tools. Cooking utensils should be durable and easily cleaned. These qualities are essential: heavy duty materials, seamless, rounded corners, no rims, balanced safety grip handles, open beads, flat bottoms, and easy stacking. Lists of small equipment are included for the salad department, the cooking department, and the bakery department. Items range from measuring cups, to spoons, to scales, to thermometers, to baking pans and storage containers.

COLLEGE AND UNIVERSITY BUSINESS

Vol. 30, February, 1961

*When it comes to food acceptance. V. Groth.—p. 57.

Food Acceptance. In college food service, food acceptance is influenced first of all by administrative policies. Not only the budget, but pleasing dining facilities, boarder allowance, and the question of placing limits on butter and milk are the kinds of things involved. Attitude and appearance of the employees who serve students, and the imagination and initiative of the food service director are other factors. Not to be forgotten are the students themselves, as they come from different backgrounds, have different attitudes and problems (those of weight, complexion, and so on).

FOOD SERVICE

Vol. 23, January, 1961

*New industry image for the sixties. G. Vukelich.—p. 28.

*Trend in the making: fully air-conditioned kitchens. J. Janson.—p. 32.

*A forward look at cold food storage. Part 2. D. W. Stewart.—p. 35.

New Industry Image. Thirteen questions on the restaurant industry are asked of Donald Greenaway, Executive Vice-President of the National Restaurant Association. His answers indicate that food service is a complex management problem and will continue as such as larger companies diversify and expand. The industry is years away from any kind of monopolistic situation. Pressing problems discussed are mounting costs, developing volume, need for management training, technical solutions to problems arising from cost increases, and greater support by the industry of its trade associations (uniting for strength and leadership). Also considered are minimum wage proposals, automation, convenience foods (resulting in "sameness" and lack of imagination), problem of marginal workers, sanitation and standardization research, role of education, and the future of the industry.

Air-Conditioned Kitchens. Electric cooking creates comfort and boosts morale. It also makes it economically possible to air-condition the kitchen. The air-conditioning systems of two Chicago operations are described. At one, it was determined that the energy required would be 130 kw. of connected cooking equipment, with 40 to 45 kw. of cooking "average demand." A water-cooled, 30-ton compressor handles the entire cooking load. The dish room exhausts 400 to 500 cfm (cu. ft./min.) and the kitchen canopy about 3000 cfm. Extra air is drawn in through a ceiling intake and from the dining room. Statistics are given also for the installation in one of Chicago's large department stores.

HOSPITAL MANAGEMENT

Vol. 91, February, 1961

*Lenten dishes that are different. I. L. Dolan.—p. 58.

Trends in food service and equipment. A. C. Donovan.—p. 69.

Olives for Lent. The ripe olive, a unique fruit because of its fruit oil content, is usually considered a relish. But many dishes owe their interest to the olive, whether whole, pitted, chopped, or sliced. Ripe olive cocktail, gelatin salad, spaghetti sauce, rice casserole, soufflé, and rarebit are among the suggestions given. Recipes are included for a tamale casserole and Mexican chicken pie, featuring ripe olives.

HOSPITALS

Vol. 35, January 1, 1961

*Shaping food purchasing patterns. K. Elman.—p. 68.

Vol. 35, January 16, 1961

*Molding effective dietary-administration relationships. M. V. Bounds.—p. 93.

Vol. 35, February 1, 1961

*Hospital meals à la carte. A. E. Hopper.—p. 64.

Food Purchasing Patterns. By establishing well defined purchasing patterns, the food service director can direct more time to other administrative duties. Four objectives are elaborated which will result in proper purchasing. They are: defining standards of quality; maintaining a constant supply of items, with storage and refrigeration facilities in mind; determining the menu suitable to the size and type of institution; and buying in correct sizes or quantities. Competitive buying is another factor to consider.

Dietary – Administration Relationships. As a department head, the dietitian is a planner, organizer, director, coordinator, evaluator, and reporter. Each of these functions is analyzed. A "Functional Chart for Dietetic Service" (developed by the Veterans Administration) is presented also. It shows the relation of the chief and assistant chief dietitian to patient therapy and clinic-research,

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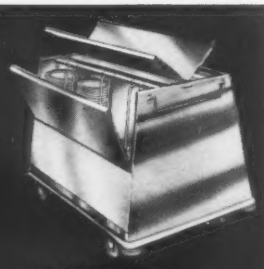

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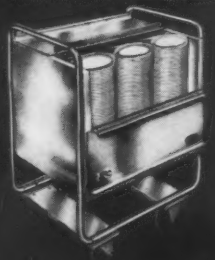

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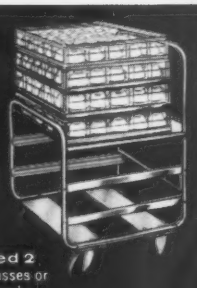

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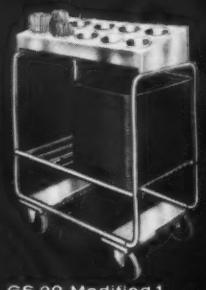

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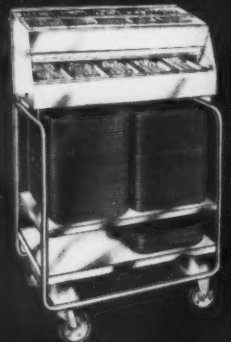

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Restaurant-Type Menu. For the past year, Mount Sinai Hospital in Chicago has used a menu which is comparable in format and in variety of selection to menus in finer restaurants. Professionally printed and designed, it contains an explanation of the kosher dietary service, a greeting from the dietary department, and information about the gift shop in addition to the three menus for the day. The menu is illustrated. Specialties of the hospital are described (such as rock cornish hen with wild rice, trout amandine, a cold buffet plate, and after-dinner drinks). Supervision, patient visitation, and food costs are discussed.

INPLANT FOOD MANAGEMENT

Vol. 8, January, 1961

*What top management expects from food services. D. L. Kurshan.—p. 28.

What Top Management Expects. The industrial cafeteria manager is expected (a) to satisfy fully the desires of all employees for nourishing, tasty food in variety, served in a clean, attractive atmosphere at reasonable prices; and (b) to run the food service operation more efficiently and effectively than any other phase of the company's business. Thus, the manager must be qualified in all areas of food preparation and service, in personnel relations, in cost procedures, in merchandising, and in communication skills. Imagination, ingenuity, salesmanship, and a high order of managerial ability are required. Advancements in equipment, the cost-price squeeze, cutting labor costs through automation—these are among the factors which demand constant re-evaluation.

INSTITUTIONS

Vol. 48, February, 1961

*Small fry specialties. J. Wilkinson.—p. 10.
Put fish on top during Lent.—p. 12.
*What makes a recipe fail? M. Kolinchak.—p. 74.
*Fashion goes to work.—p. 90.
Kitchen design simplifies in's and out's of outside-inside operation.—p. 110.
*Sanitation for food service workers. T. M. Richardson.—p. 114.

Small Fry Specialties. Children prefer a combination of familiar foods, well seasoned (but subtle), prepared for easy eating (finger foods and bite-size pieces not requiring adult help), plus color, and crunchy garnishes. Applying these guides, quantity recipes are given for shepherd's pie, shrimp macaroni casserole, tic-tac-toe burger, and Little League meat cups.

Why Recipes Fail. Recipe failures may not be due to faulty recipes, but to faulty application. Examples of where mistakes can be made are given for pie crust (measuring the flour, water absorption property of the flour, extra flour used in rolling out dough); for vegetable soup (length of simmering time); for spices (flavor dete-

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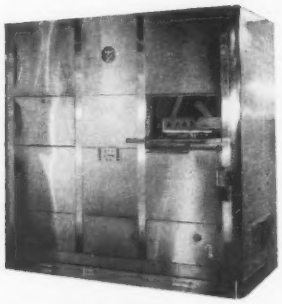

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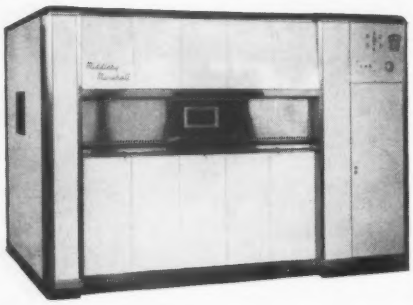

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riorates rapidly on storage). Oven temperatures are another cause of failure if thermometers are incorrect. Quality of raw foodstuffs, proper equipment, and local standards are other factors.

Fashion in Uniforms. Trends in uniforms of all kinds are described and illustrated. Sleeve innovations and such features as no "waist-line ride up," collars slit for comfort, adjustable sizes, concealed hold-all pockets, and fold back cuffs that stay in place are mentioned for women. For men employees, dinner clothes are available in many colors and styles; synthetic materials mean easy up-keep; vests are popular.

Sanitation. The new address and materials available from the Communicable Disease Center, U.S. Public Health Service, Atlanta, are listed. There is a wealth of material available on sanitation training. The Audio-Visual Section has in its library 322 different films (about 35 prints of each) and has recently been designated by the Public Health Service as a center for distribution of all of its motion pictures and filmstrips. Included are exhibits on radiologic health, and films on such subjects as plague, safety measures in the laboratory, peaceful use of nuclear energy, hand-washing in patient care, nutrition, and upper respiratory disease.

MODERN HOSPITAL

Vol. 96, January, 1961

*How to make words say what you mean. L. Nadler.—p. 78.

*Cafeteria keeps employe complaints in line. J. W. Bloch.—p. 108.

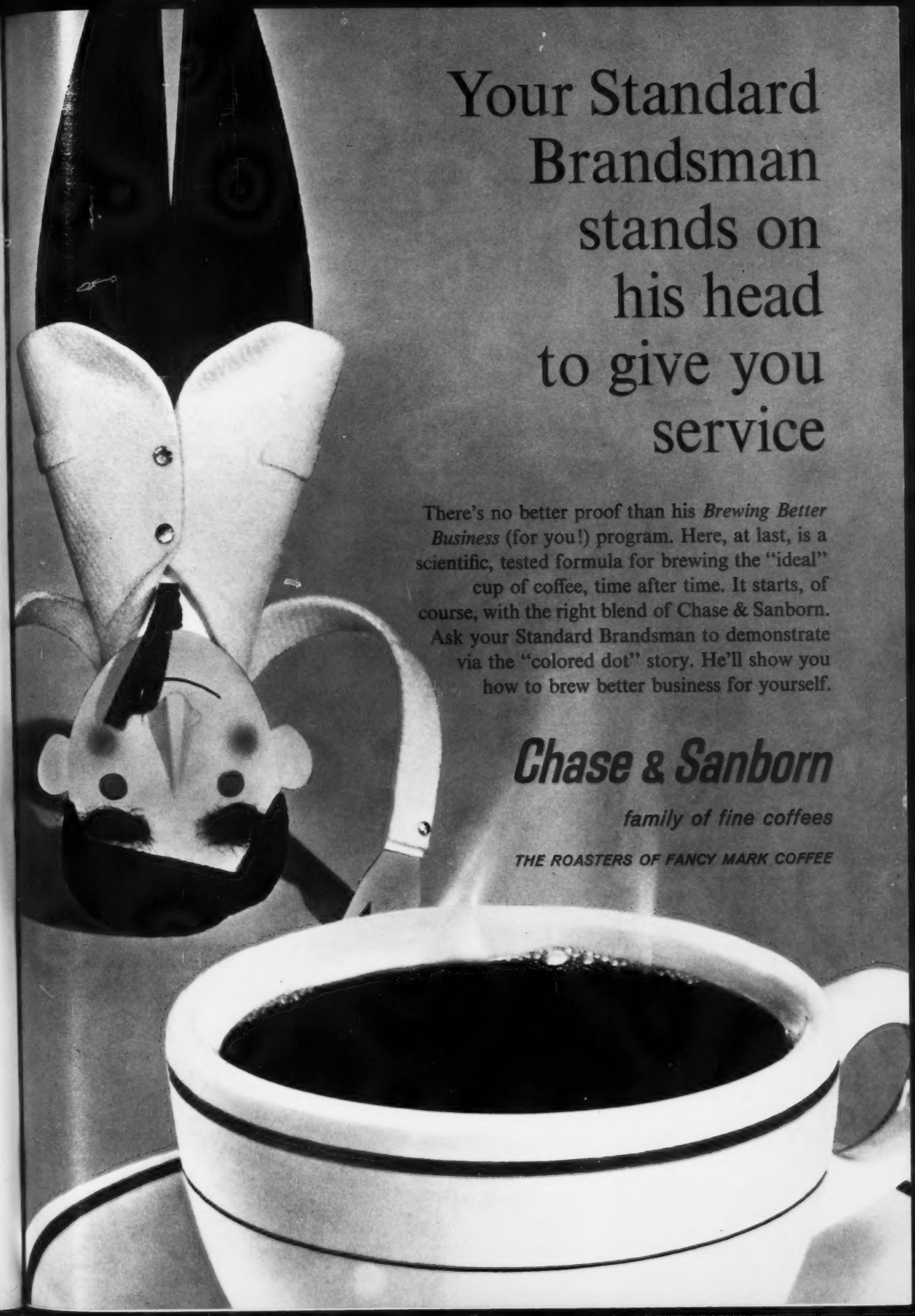
*The cost of serving chicken is chicken feed. D. Zumsteg.—p. 110.

Food service departments need clearly written policy manuals. J. Hartman.—p. 116.

Training in Communications. Suggestions are given for training supervisors in effective communications. Steps discussed in the individual communication of one person to another are: act, impact, evaluation, reaction, act, and impact. Communications related to supervisory positions take three directions: upward to higher supervisors, downward to subordinates, and across to other supervisors. Charts are given which suggest what is communicated in these cases (reports, praise, requests, and so on) and how it is communicated (writing, conferences, telephone).

New Hospital Cafeteria. Three different dining rooms (for staff, doctors, and employees) at Montefiore Hospital in New York City have been replaced by a central pay cafeteria with selective menus. Less food is required, employee complaints have decreased, space requirements have been reduced, a greater variety of foods is offered in more attractive surroundings, and food cost control has improved. Decor, equipment, and service are described.

The Efficient Chicken. The nutritional value of chicken, developments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in the raising of the birds, low cost, and versatility in preparation all add up to the efficiency found in using this meat. Tables are given listing some nutrients (protein, fat, calories) in various cuts of chicken, turkey, veal, beef, pork, and lamb; and comparison of the cost of cooked edible portions of meat and poultry. Chicken shows up most favorably in both cases. The numerous forms in which chicken may be purchased are enumerated.

PERSONNEL JOURNAL

Vol. 39, January, 1961

*Motivation by dynamic supervision. R. M. Bellows.—p. 304.

*Personnel administration and the corporate image. G. S. Odiorne.—p. 331.

Supervision. Two kinds of supervision are discussed and illustrated: directive (authoritarian) and cooperative. It is concluded that authority is a useful and fair practice only when it is needed for the welfare of the group. The creative, dynamic supervisor will be sensitive to and analyze the situation in order to make more accurate judgments as to how much authority is necessary and how much cooperation can be used, for the maximum benefit to the greatest number of people.

The Corporate Image. The extent of favor or disfavor with which various publics hold the corporation in our society is important to the continued growth and prosperity of our major companies. It is as much the responsibility of the employee relations manager as the public relations man. The corporate image of most companies is based on institutional advertising, donations and support of community activity, businessmen in politics, various public relations methods, and college relations. Personnel administration can improve the image further by following these guides: (a) Understand how the corporation is viewed generally. (b) Show warmth and consideration for employees. (c) Avoid, inasmuch as possible, religious and political situations. (d) Create favorable employee impressions of the corporation. (e) Develop good personnel practices (hiring, advancement, salary, fringe programs, and so on).

VOLUME FEEDING MANAGEMENT

Vol. 16, January, 1961

*Planning for volume production. G. W. Gunderson.—p. 24.

*Operating an efficient kitchen. C. H. Parke.—p. 26.

*Routing traffic through a kitchen. R. Dickie and D. Ridler.—p. 28.

*Take advantage of equipment versatility. W. H. Kahrl.—p. 31.

*How to schedule food preparation. S. Fleer.—p. 78.

*Menu planning dictates buying procedures. H. Cassidy.—p. 80.

*Space engineering controls turnover. F. Schmid.—p. 140.

*How valuable is a waste disposal unit? C. F. Stephenson.—p. 166.

*How the menu controls dishwashing costs. H. J. Dutton.—p. 168.

*Sanitation is part of menu-planning. H. S. Fischbach.—p. 171.

*Glasswashing . . . methods and problems. E. J. Smith.—p. 173.

*Methods for handling and washing glassware. C. A. Wood, Jr.—p. 175.

Volume Production. A good menu made up of good food is dependent on trained, contented personnel, working in adequate facilities. The placement of equipment in relation to function and storage, the flow of traffic, volume, duration of serving time, and use of pre-prepared foods are among the factors relating to successful food production.

An Efficient Kitchen. The menu should be planned so that a balanced load is placed on the kitchen each day; this balance relates to size of staff, ability of staff, and equipment available. The menu should also provide a relatively constant work cycle (aided by use of work sheets). Simplicity and balance are steps toward maximum efficiency.

Routing Kitchen Traffic. Kitchen traffic is related to management (placement of offices in semi-quiet place for supervisory personnel, near kitchen and outside door for first line manager who deals with both production and sales representatives). Traffic also relates to materials (there should be a known place for people, materials, and equipment, and travel should be reduced wherever possible, every move being made in the direction of

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the ultimate destination). Personnel traffic involves locker rooms near the entrance, equipment and materials at each work area. Maintenance traffic should be kept out of the kitchen by placing such items as refrigerator compressors and grease traps on the floor beneath the kitchen and by checking and cleaning other equipment in the evening, whenever possible.

Equipment Versatility. Equipment must be versatile because of the many different food items to be prepared, because of variations in rush and slow periods, because of peak and slow days, seasons of the year, possible future expansion, layout changes, and cost of operation and cleaning. Compact size and mobility are two features which are showing up in new equipment. Selection depends on menu, methods used, and standards of service.

Scheduling Preparation. Observing and studying various activities in the kitchen gives one a basis for plotting the man-hours required to do a job. On this basis, work schedules can be planned ahead and supervisors are in a position to check work as it is being done, with the ability to overcome difficulties and make reassignments more intelligently.

Menu Planning and Buying. The selective cycle menu demands accurate purchasing. Specifications can be set up to answer individual needs. Hints are given for purchasing such items as meats, fresh fruits and vegetables, and canned goods. The use of a perpetual inventory, duties of the receiving clerk, delivery schedules, and pricing are among the points discussed.

Space Engineering. Space engineering for customer turnover will result in operating profit. Through a chart and discussion, it is shown how the menu and merchandising policy influence type of service, standard of service, speed of service, prices, average check, seating capacity, layout of equipment and furnishings, hours of operation, and atmosphere.

Value of Waste Disposal Unit. A study was made to develop an economic analysis of a waste disposal unit installation in a hotel. There was a potential disadvantage in increased waste of food and damage to utensils or equipment through careless disposal. On the other hand, the cost savings and related improvements were so substantial that the installation was considered an excellent investment.

Dishwashing Costs. Dishwasher size must be influenced by the maximum number of persons to be served per hour. Location of equipment, use of two machines instead of one in larger installations, the E-shaped layout, supplementary equipment, and specifications relating to plumbing, electricity, and materials used in the area are discussed.

Sanitation. Lack of sanitation facilities can determine that certain menu items are impractical in certain establishments. Examples are chicken pie (if there is no place to put it between cooking and serving time), banana cream pie (if there is no refrigerator space), casserole dishes (if there are not enough flat racks for washing the casseroles), and salad and relish dishes (if employees do not wash them properly). Better and more sanitation training programs are imperative.

Glasswashing Problems. Glass items are becoming more widely used by volume feeders, and washing becomes a problem from the standpoint of payroll, control, breakage, and maintaining maximum sanitation. The only solution lies in new and improved equipment that can reduce the number of employees.

Glasswashing Methods. Directions are given for glasswashing, using centralized systems, decentralized systems, and for cold water glass washing. Breakage can be minimized by utilizing portable trucks, glass rack dollies, and portable glass rack dispensers. Plastic coated glass racks help.

WHAT'S NEW IN HOME ECONOMICS

Vol. 25, January, 1961

*Basic guide to good nutrition. E. F. Phipard. —p. 30.

Guide to Good Nutrition. A four-group food guide has been developed in the light of current knowledge of nutritional needs and is often used in place of the Basic-7 guide developed in the early 1940's. The four groups are described—the milk group, the meat group, the vegetable-fruit group, and the bread-cereals group.

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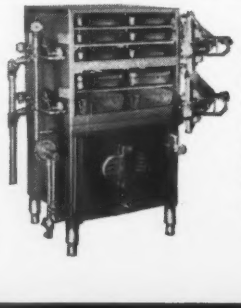

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Summer Study Opportunities. For the fifteenth year, the College of Home Economics, *Syracuse University*, and the Nutrition Bureau of the New York State Health Department will present a Community Nutrition Institute. The dates: June 12 to 23. Focus of the first week's program will be on energy metabolism. Jean Mayer, Ph.D., Associate Professor of Nutrition, Harvard School of Public Health, will be in residence as both participant and coordinator of the week's sessions. The second week will be devoted to helping the patient with a chronic disease modify his diet and will include consideration of eating habits, living situation, personal and environmental factors affecting eating, and the role of various members of the health team working for the patient's welfare. Further information may be obtained from Linnea Anderson, School of Nursing, Syracuse University, Syracuse, New York.

* * * *

A summer workshop on food service administration will be given June 14 to 30 at the *University of Minnesota*. Emphasis will be on human relations and communications, cost control and food purchasing, and equipment. Three credits will be earned by participants. Further information is available from: Dean, Summer Session Office, 135 Johnston Hall, University of Minnesota, Minneapolis.

Southeastern Dietitians to Meet. The program of the Southeastern Hospital Conference of Dietitians to be held in Memphis, April 19 to 21, has been announced and will include:

"Nutrition Quack—The Latter-Day Pitchman"—Philip L. White, D.Sc., Director, Department of Foods and Nutrition, American Medical Association, Chicago

"The United States' Program to Improve World Nutrition"—Dr. Arnold Schaefer, Executive Director, Interdepartmental Committee on Nutrition for National Defense, National Institutes of Health, Bethesda, Maryland

"Staff Development"—Maniza Moore, Coldwater, Mississippi

"Keeping Food in Step with the Times"—Evelyn J. Kennedy, Southern Field Dietitian, General Foods Corporation, Atlanta

"Problems Facing the Voluntary Hospital System"—Dr. Frank Groner, Administrator, Baptist Memorial Hospital, Memphis

Coming Events. April 24, 1961—Scientific Session on "Recent Advances in Applied Nutrition" sponsored by *Medical Society of the County of New York* with the *Food and Nutrition Council of Greater New York*. Place: Hotel Barbizon Plaza, New York City. Speakers: Robert E. Olson, M.D.; Paul Gyorgy, M.D.; and William Henry Sebrell, Jr.

* * * *

May 22 to 25—42nd Annual *National Restaurant Convention and Educational Exposition*. Theme: "The Changing World of Food Service." Special feature of program: 3½-hr. food show, covering delayed service cookery, convenience foods, frozen bakery items, and so on. Place: Chicago.

* * * *

May 22 to 26—*Institute for Dietary Consultants and Shared Dietitians*, co-sponsored by the American Hospital Association and The American Dietetic Association. Place: Chicago.

* * * *

June 13 to 15—26th annual convention of *The Canadian Dietetic Association*. Place: Vancouver, B. C.

* * * *

June 27 to 30—52nd annual meeting of the *American Home Economics Association*. Theme: "Scientific Development Influencing Family Life." Place: Cleveland.

* * * *

July 2 to 7—38th Annual Conference of the *American Physical Therapy Association*. Theme: "Aftercare Programs." Place: Chicago.

* * * *

July 10 to 14—*3rd International Congress of Dietetics*. Theme: "Tradition, Science, and Practice in Dietetics." Place: London.

* * * *

August 21 to September 6—*Tenth Pacific Science Congress*. Place: Honolulu, Hawaii.

The following foods are on the USDA's list of plentiful foods for April.

Protein foods

Milk and dairy products
Peanuts and peanut products
Turkeys

Other foods

Cabbage
Cranberry products
Olives, canned ripe
Peaches, canned freestone

Frozen Foods for April. With spring on the way, the National Association of Frozen Food Packers recommends the use of the following foods in April, all of which will be generally available.

Frozen fruits

RED RASPBERRIES—Defrost this colorful fruit and serve on cereal for breakfast, or as a fruit dessert choice for dinner.

STRAWBERRIES—Combine with frozen rhubarb in tarts and pies; also excellent when used in gelatin desserts.

Frozen vegetables

BEANS, GREEN—There are many ways to vary this favorite: join with other vegetables, such as corn or onions, where its color contrast counts; serve sometimes with mushrooms or almonds; and perk up the flavor with herb-flavored butter or margarine.

BRUSSELS SPROUTS—When cooked in small batches, they are great favorites.

CARROTS—This earthy vegetable comes ready-for-the-pot, saving much time in making stews and in other combinations.

PEAS—Use their color advantage along with other vegetables in salads as well as for the usual "buttered peas." Figures show this vegetable is the favorite of all.

Other frozen foods

FROZEN PIES AND BREADS provide an easy way to satisfy the public desire for fresh baked foods, without the cost of space and labor for a baking area.

FROZEN PREPARED FOODS—meat, poultry, and seafood pies—are other labor-saving menu additions. Other casserole-type frozen dishes now come in steam table-shaped aluminum foil containers, and many meat and seafood dishes in sauces may be used for individual orders by heating pouches in boiling water.

Interns Graduate. On January 7, a graduation dinner was held at Henry Ford hospital, Detroit, in honor of five dietetic interns completing their year's work. David L. Everhart, Assistant Administrator, spoke to the graduates, after which, Margaret King, Director of Dietetics, presented the traditional cap, pin, and diploma to each of the following:

Ann Heise, University of Oklahoma
Nancy Gullen, Michigan State University
Shirley Denslow, Wayne State University
Linda Damm, Rochester Institute of Technology
Dorcas Sherman, Michigan State University

Clarification. In the March issue of the JOURNAL, data on "Lesser Known Vitamins in Foods" as compiled by Mervyn G. Hardinge, M.D., Dr.P.H., Ph.D., and Hulda Crooks, were published. The editors regret that an error in column headings occurred. For each of the six vitamins reported in Table 1, the heading of the first column of figures should read "Weight per portion" and of the second column, "Weight per 100 gm."

Booklet for Nursing Homes. *Meal Planning, Food Buying—for Small Hospitals and Nursing Homes* is the title of a fifty-seven-page booklet just issued by the School of Home Economics of the University of Alabama.

Prepared by Kathleen Stitt and Elizabeth Neige Todhunter, Ph.D., its eight chapters cover the following topics: food service—its place in the hospital program; meal planning; modifying the normal diet for the sick and aged; food buying; storage of food; sanitation in food preparation and food service; food service suggestions; and additional sources of information.

The clear-cut information on menu planning and food purchasing should be especially helpful to operators who do not have qualified dietitians available to supervise and plan food service. In the menu-planning chapter, not only is a basic menu pattern given, but menu-planning ideas for each food group are listed, as well as sample menus for winter and summer. To help in food buying, a sample market order form is presented, as well as specific suggestions on how to buy meat; fish; poultry; eggs; dairy products; and fresh, canned, and frozen fruits and vegetables. Six pages are devoted to a table on amounts to buy.

Copies of this booklet may be ordered for $1 from: School of Home Economics, Box 1405, University, Alabama.

Other Publications. Of stimulating interest, we believe, is the first quarter, 1961 issue of *SRI Journal* issued by the Stanford Research Institute. It is devoted to "Thought for Food," with emphasis on food in the future. The titles of the articles range from "Menu for Tomorrow," "The Coming Science of Nutrition," "The Kitchen of 1980," to "Future Trends in American Diet." Other topics are: "Food for the Hungry of the World" and "Weight Control: A Fat Problem for Research." Contributors for this issue include Hazel K. Stiebeling, Ph.D., Director of the USDA's Institute of Home Economics; Doris Howes Calloway, Ph.D., Chief of the Nutrition Branch, Quartermaster Food and Container Institute for the Armed Forces; and John P. Nielsen, Ph.D., of the Stanford Research Institute, all of whom have contributed to our JOURNAL in the past. Copies of this issue may be ordered for $1 each from the Stanford Research Institute, Menlo Park, California.

* * * *

From The American Association of Petroleum Geologists, Inc., comes a most useful booklet for anyone who must prepare illustrated lectures. Titled *Slide Manual*, it is "A Guide to the Preparation and Use of Projection Slides." Emphasis is, quite naturally, on the preparation of slides for technical papers. Nevertheless, it is applicable to many other situations, and certainly the basic information on preparing copy for slides and transparencies and their production should prove valuable to dietitians and nutritionists involved in public presentations. The contents are divided into five major sections: slide copy, physical characteristics and specifications of projection slides, projectors, screens, and pointers. Such helpful information is included as a table on minimum letter sizes for slide copy, line widths for lettering and ruling, editing of slide copy for easy visibility, and types of recommended slides. The last page of the booklet is devoted to a bibliography which includes references such as a leaflet published by the American Chemical Society, "Suggestions on How to Write, Present, and Illustrate a Technical Paper." Single copies of *Slide Manual* may be ordered from The American Association of Petroleum Geologists, Inc., P. I. Box 979, Tulsa 1, Oklahoma. The cost is $1.25.

* * * *

Although Lent will be over by the time this issue of the JOURNAL reaches our readers' hands, nevertheless the special Fisheries Marketing Bulletin, "Fish Recipes for Lent," deserves mention, we believe. Issued by the Bureau of Commercial Fisheries of the Department of the Interior, the recipes, of course, are usable all year round. Nineteen recipes, featuring everything from buffalo fish to lobster are presented. Have you tried oyster fritters or salmon curry? Recipes for these dishes are included, as well as others ranging from entrées to salads and sandwiches. Copies of this publication may be requested from the Bureau of Commercial Fisheries, U. S. Fish and Wildlife Service, Washington 25, D. C.

* * * *

Better Meals for You is the title of an attractively designed, two-color booklet published by the Diabetes Association of Greater Cleveland. It was compiled by members of the Cleveland Dietetic Association in cooperation with the Cleveland diabetes group, from the Exchange Lists. Seven "flip sheets" are provided, one for each list of exchanges. In addition, there is a small table giving the composition of each list in terms of protein, fat, and carbohydrate. The booklet is designed for the physician's use with a patient, with one page devoted to a dietary prescription, broken down by exchanges according to three meals, with blanks to be filled in. Another page provides space for sample menus planned around the exchanges. Single copies of the booklet may be ordered for 25 cents each from the Diabetes Association of Greater Cleveland, 1465 East 55th Street, Cleveland 3. Quantity discounts are also available.

Citrus Trends. Since 1935, consumption of processed citrus (estimated on a fresh-weight basis) has risen from about 4 lb. per person to 53 lb. in 1960, according to the USDA, and today we are eating more citrus fruit in processed form than fresh. The trend in the use of fresh citrus has also been reversed and is now down. Between 1935 and 1945, it rose from about 45 lb. per person to 68 lb., but by 1960, it had fallen to 34 lb. The

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rise of frozen juice concentrates, especially orange, which began in the late 1940's and the more recent trend to chilled juice are given as reasons for these shifts. Over the years, overall per capita consumption of citrus fruits has risen—for oranges, it trended up sharply from 1935, for grapefruit moderately up until the mid-forties, and for other citrus fruits, up gradually. Use of oranges has recently been about three times that of grapefruit.

Hawaiian Foods May Come to the Mainland. The Hawaii Agricultural Experiment Station has been studying methods of processing tropical fruit which might be exported to the mainland. One project has involved the canning, freezing, drying, and freeze-drying of the mango. Frozen mangoes, it found, retain a high proportion of ascorbic acid and vitamin A as well as flavor. A disadvantage seems to be the amount of hand labor required to peel and seed mangoes for freezing and canning. However, a promising canned product is mango nectar, made by first blending the whole fruit with water in a mechanical blender, then straining off seeds and skins. The canned nectar held 80 per cent of its ascorbic acid after eleven months' storage at 85°F. Drying has not as yet produced a quality product, either as to flavor or vitamin retention. However, freeze-drying—which has been used satisfactorily for pineapple—appears promising, according to Station scientists.

Another product under development is a frozen concentrated coconut milk. The principal processed coconut products currently are chips, shredded coconut, coconut sirup, and frozen coconut milk. A successful concentrate might bring the product a mainland market as a specialty product for Hawaiian cookery.

Blue Cheese Flavor. A low-cost method for producing blue cheese flavor without the use of expensive blue cheese has been developed by scientists at the University of Wisconsin, according to *Food Field Reporter.* Bacteriologists R. F. Gehrig, S. G. Knight, and J. M. Kornfeld have discovered that spores of the mold used in blue cheese production will also provide a blue cheese flavor when aerated through specially prepared cream or milk. The new product is said to be a white liquid with exceptional stability. The liquid product provides a natural flavor when diluted about four to one. It can be canned, dried, or used fresh. The new product should have uses in dips, spreads, and salad dressings, and on crackers.

Army Personnel Announcements. The following personnel changes have occurred in the Army Medical Specialist Corps:

Regular Appointment
1st Lt. Carol M. Sampson
Promotions
To Major: Helen E. Price
To 1st Lt.: Nancy L. Spragg
Separations
Regular Army—Major Mary Breazeale
Reserves—1st Lt. Jane L. Welches
1st Lt. Mary R. Luce
1st Lt. Iris A. Chase

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800 Fulton Street, Pittsburgh 33, Pa.
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News of State Associations

Delaware Dietetic Association. On February 24 and 25, the Delaware Dietetic Association joined the Delaware Home Economics Association in sponsoring a seminar on communications. In March, the regular program was devoted to a panel report by three dietitians concerned with research: Joanne Robertson, Lankenau Hospital, Philadelphia; Patricia Fessler, DuPont Hotel, Wilmington; and Mayton Zickefoose, of the State Board of Health, Dover.

Georgia Dietetic Association. On February 23, the *Augusta Dietetic Association* presented a "Style Review of Dietetics" at a tea for some two hundred students of surrounding communities. A local announcer served as the narrator, while local

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dietitians "modeled," depicting the various phases of dietetics.

The *Atlanta Dietetic Association* on February 6 heard a panel discussion on "Hospital Dietary Management." Participants were: Helen Jenkins, Emory University, who spoke on "Equipment"; Helen Hovis, Georgia Department of Public Health, who discussed diet manuals; and Faye Young, VA Hospital, whose topic was "Cost Accounting."

Kentucky Dietetic Association. March 16 was the date of the Kentucky Dietetic Association's meeting in Louisville. The program included the following papers and addresses:

"New Frontiers in Food Enrichment"—N. W. Flodin, Ph.D., Lysine Division, E. I. DuPont de Nemours & Co., Wilmington, Delaware

"Feeding the Space Traveler"—Beatrice Finkelstein, Food Technology Section, Wright-Patterson Air Force Base, Ohio

"Flavor Analysis on a Scientific Basis"—Lewis Minor, Cleveland

"Do Our Invaders Have a Secret Weapon?"—Harold Keller, New York City

"How to Train"—film by Standard Brands

Nelda Ross Larsson attended the meeting as A.D.A. representative and reported on the White House Conference on Aging.

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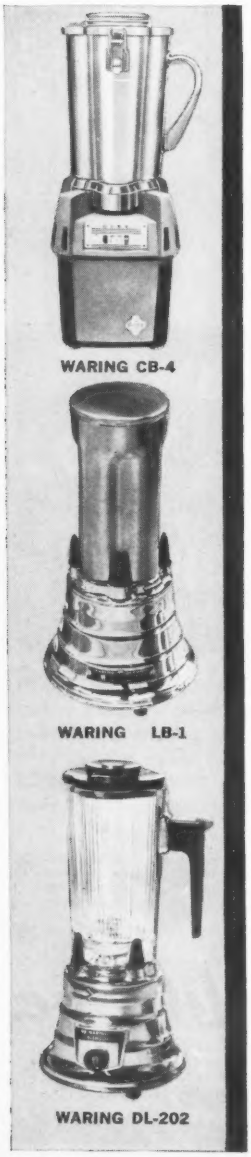

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New York State Dietetic Association. A seminar on "Nutrition in Nursing Education" was co-sponsored in March by the *Genesee Dietetic Association* and the Genesee Valley League for Nursing to explore what a nursing student needs to know about nutrition.

South Carolina Dietetic Association. Members assisted in the planning of a nutrition symposium, "Nutrition Advances Affecting Health," held at the Medical College of South Carolina in Charleston in January. Co-sponsor of the event was the South Carolina Nutrition Committee. Participants included: dietitians, doctors, nutritionists, residents, interns, extension agents, home economics teachers, public health officials, and others from related fields. The program included:

"Food Contaminants"—Philip L. White, Sc.D., Director, Department of Foods, American Medical Association, Chicago

"Recent Advances in Nutrition"—John B. Youmans, M.D., Director, Division of Scientific Activities, American Medical Association

"Food in Our Lives"—Faith Clarke, Ph.D., Institute of Home Economics, U. S. Department of Agriculture, Washington, D. C.

"Taking Stock of South Carolina's Foods"—a panel discussion moderated by Hilla Sheriff, M.D., Chief, Maternal and Child Care Division, South Carolina Department of Health

Tennessee Dietetic Association. Dietitians in Chattanooga have formed a new *Chattanooga Area Dietetic Association*, with twenty-two members. Officers are: President, Frances Copeland; Secretary, Claire Copp; and Treasurer, Miriam Sansky.

The *Knoxville Area Dietetic Association* has published a new diet manual which covers all modified diets used in the hospital. Copies may be ordered for $2.50 each from: Mrs. William Newkirk, Route 8, Kodak Road, Mascot, Tennessee.

The *Memphis Dietetic Association* is now publishing a monthly bulletin which contains announcements of future monthly meetings, news of members, job opportunities, and items of special interest compiled by the diet therapy committee.

Public Relations in the States

By HELEN G. INGERSON,
A.D.A. Public Relations Chairman

Illinois. The Illinois Dietetic Association has started the ball rolling in an effort to sell exhibitors and purveyors on the importance of the dietitian to them. To get facts that speak for themselves, directors of dietetics in Illinois are being surveyed to obtain

History of The American Dietetic Association

1917-1959

Mary I. Barber, Editor

This is the first official history of the ADA from its inception in 1917 through 1959. More than being merely a record of the Association, its origin, structure, aims and accomplishments, this new book includes the many personalities that represent its leadership and explores the role of the dietitian from ancient times to the Space Age.

Chapter 1 considers the term "dietitian" historically, and presents a definition which describes the dietitian's responsibilities today. Chapter 2 outlines the history of dietetics from the ancient Ebers papyrus to the present, highlighting the achievements of great figures in the history of nutrition.

Chapter 3 gives an interesting account of the founding of the ADA. Chapters 4 through 7 record by decades the spectacular advances both of the ADA and of the science in general. Chapters 8 through 14 describe the structure of the Association, and the work of the various Committees and Sections devoted to education, community nutrition, diet therapy, etc.

Chapters 15 through 19 cover the history of dietitians in military and government service, the United States Children's Bureau and the role of the Journal of the ADA and the Association's Public Relations Department. Chapter 20 relates the challenging aspects of dietetics in the Space Age.

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Iowa. A second edition of the *Simplified Diet Manual,* written by the staff of Nutrition Service, Iowa Department of Health, in cooperation with the Community Nutrition Section of the Iowa Dietetic Association, will be published this year. The manual serves as an excellent contact with small hospitals and nursing homes.

New York State. Exhibits have played an important part in the public relations activities of the New York State Dietetic Association. *Greater New York* developed an exhibit for the National Hotel Exposition entitled "Weight Watcher." An exhibit on dietetic careers and a display on optimal nutrition was shown at the New York Health Exposition.

Missouri. The Communications Council of Home Economics Organizations in Missouri has started a series of "Common-I-Q" columns in the bulletins of the state dietetic, home economics, and vocational teachers associations. The associations take turns in contributing to the columns.

St. Louis used the direct approach when the president of the state association and the state chairman of public relations and career guidance appeared on two radio shows. Listeners were invited to telephone questions about nutrition directly to the two dietitians.

Ohio. The Public Relations Chairman of the Ohio Dietetic Association hit on the ingenious idea of compiling the news sent from each local association into a winter, spring, summer, and fall issue of a publication entitled, "Reporting Public Relations."

To prepare material for 1961 exhibits, the Ohio Association started a poster contest a year ago. Entries were judged in December by members of the executive board. The winners of the $25 awards were from the *Akron* and *Columbus Dietetic Associations.* The posters are now ready to use as exhibit material.

Pennsylvania. During November, many Pennsylvania dietitians participated in a program in Philadelphia on "Current Trends in Nutrition" conducted by the Foods and Nutrition Department of the Drexel Institute of Technology. The program, designed to extend nutrition education to the public, attracted not only home economics students, but also students in other areas of specialization, student nurses, practical nurses, teachers and representatives from business and governmental agencies.

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Association Activities

A.D.A. Meeting. The A.D.A. Executive Board held its mid-year meetings in Chicago, the week of February 20. The Council of the House of Delegates met on February 23, and the Coordinating Cabinet met on February 24. The Finance Committee held its meeting on February 23.

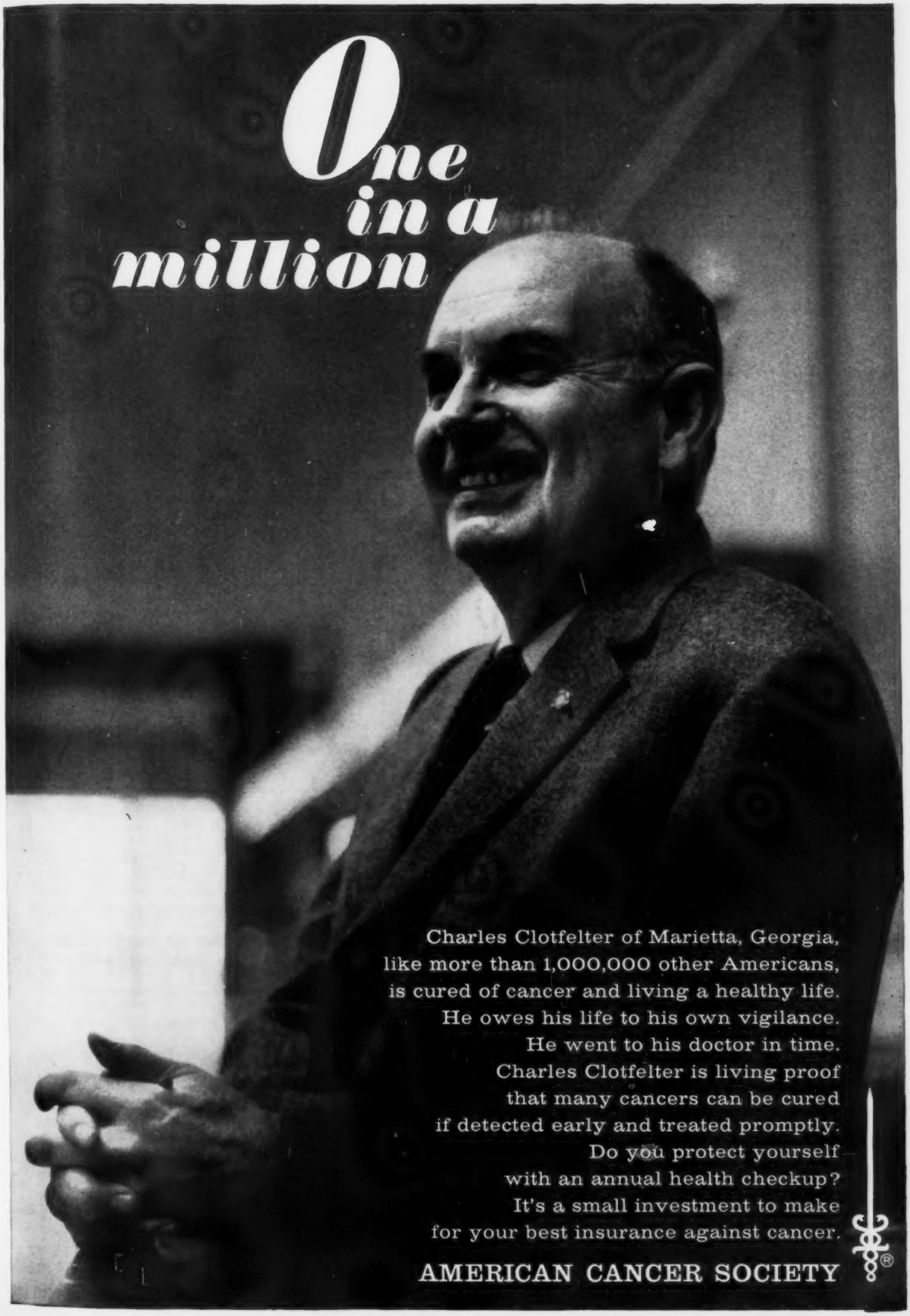
A.D.A. Representatives. Virginia F. Harger will be the national representative participating in the *Tennessee Dietetic Association* meeting in Memphis, April 14 to 16.

Doris Johnson, Ph.D., as our representative will attend the *Ohio Dietetic Association's* meeting in Dayton, May 25 and 26.

Virginia S. Blatchford, Norwalk, Connecticut, the Association's representative to the *National Advisory Committee on Local Health Departments,* attended the meeting of this Committee on March 13 in New York City.

Dorothy Kinnear, New York City, represented the Association as an alternate delegate at the *National Health Council's* Annual Meeting of Delegates on March 16 in New York City.

Miss Kinnear, Nelda Ross Larsson, and Jane Andrews were official repre-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sentatives at the 1961 *National Health Forum* on March 14 to 16 in New York City. The theme was "Better Communication for Better Health." The A.D.A. flag was displayed at this meeting.

Edith Jones, Bethesda, Maryland, represented the Association at a luncheon on February 1 in Washington, D.C., prior to the launching of the 1961 *Red Cross* Campaign. This meeting was called for the purpose of interpreting to women's groups the need of the American Red Cross. Speakers included General Alfred Gruenther; Theodore V. Houser; Elisha Gray, II; Mrs. Arthur Goldberg, wife of the new Secretary of Labor; Mrs. Elizabeth Smith, our new Treasurer of the United States; and Margaret Hickey.

Evelyn Carpenter, Philadelphia, will serve as our representative to the 23rd *Friendship Fete* to be held in Philadelphia on April 15. "Food—The Link of Friendship" will be the theme for the Fete, which will highlight the work of FAO.

Courier. The next issue of the *Courier* will reach each member in May. We would like to call to your attention particularly the opportunities in continuing education and career guidance in which you, as an A.D.A. member, may participate.

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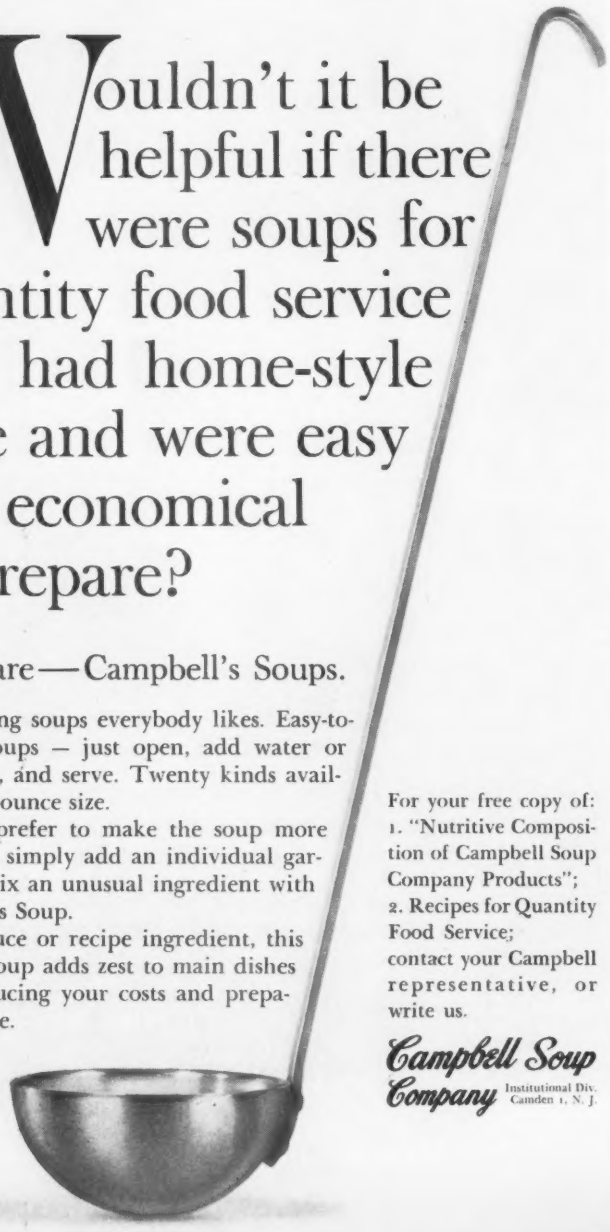

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Obituaries

Mary Elizabeth Proctor Gilpatrick. The A.D.A. office has been notified of the death on December 28 of Mary Elizabeth Proctor Gilpatrick in the Canal Zone, where she made her home with her husband, a major in the Army Medical Corps. Mrs. Gilpatrick, a member of eleven years' standing, had formerly been on the staff at Jackson Memorial Hospital, Miami. She was a graduate of Winthrop College, Rock Hills, South Carolina.

Sister Mary Josephine Swicke. The A.D.A. office has been notified of the death on December 5, 1960 of Sister Mary Josephine Swicke. She had been on the staff of the St. Joseph's Hospital, Marshfield, Wisconsin, since becoming a member of our Association in 1943.

News of Products and Services

"A Study of Methods of Grease Removal from Commercial Kitchen Exhaust Air," Research Report No. 1323, has been released by the *American Gas Association.* Problems involved in the removal of grease from commercial kitchen ventilation air are presented in this twenty-six-page, illustrated booklet. Two filters and a commercial ventilator were tested as methods of removing grease vapor and grease particles before accumulation in exhaust ducts with resultant fire hazard and cleaning problem. An experimental gas-fired incinerator located in the exhaust system is described. Results showed the prototype accomplished 97.5 per cent grease removal at 200 cfm exhaust air flow rate, with a gas consumption of 47,250 Btu per hour. This compares with 80 per cent removal under the same conditions with conventional filters. The equipment and procedure are outlined in text and pictures, as well as the development and demonstration of the model grease incinerator. One page of references and a two-page list of American Gas Association Laboratories Research Publications conclude the booklet. It is available at a cost of $1.

A new 18-ft., flight-type dishwasher for institutional kitchens serving up to 1350 persons has been introduced by *The Hobart Manufacturing Company.* Model FT-18, a four-stage machine, features three sections: a 6-ft. center for washing and rinsing operations; a 6-ft. loading and scrapping section, and a 6-ft. drying and unloading extension. A link conveyor, moving at an adjustable 5 to 7 ft. per minute constructed of stainless steel links, is also available.

Angel food cake mixes that can be made entirely with an electric mixer

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FOR CONVENIENCE . . .

IT'S THE AUTOMATIC HANDS DOWN!

Just fill the hopper with any food mixture served in patty form and turn it on. The Automatic Food Shaper does the rest. You set portion control. Weight and thickness is instantly adjustable anytime *you* desire. You get perfect patties, always!

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√ *High Nutrition—Low Acidity*

So easy to prepare! A 2-lb. vacuum-packed tin of the new Lasco Orange Breakfast Drink Granules and 2 gallons of water make *69 four-ounce servings* . . . delicious, nutritious and economical!

And Your Old Favorites DELUXE Lasco® FROTHY GRANULES™

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SAVES TIME

Naturally Easy

EASY DIGESTIBILITY
EASY TO PREPARE

Patients like it.
That's why hospitals and dietitians prefer naturally nutritious
Quaker Oats and Mother's Oats are the same fine product.

The Quaker Oats Co.
CHICAGO 54, ILLINOIS

are new arrivals from *General Mills, Inc.* New flavors are Fudge Swirl, Orange-Pineapple, and a reformulated White angel food.

A small dispenser engineered to apportion a precise amount of drying agent into the final rinse line of spray-type dish machines has been announced by *Economics Laboratory, Inc.* Use of the Dri Vac Rinse Injector eliminates hand toweling. It is easy to install, with no moving parts. The injection rate is proportional to the water flow, not the pressure; pressure changes are compensated.

Practical directives and helpful suggestions for the production of quality sandwiches on a large scale are blue-printed in a 35 mm. filmstrip, with sound, from the *American Institute of Baking.* The film is based on the manual, *Modern Sandwich Methods.* Shown are an ideal sandwich center; cutting and arrangement; step-wise sandwich preparation by the multiple stack method; making and wrapping of both cut and uncut sandwiches; vending, food handling, and storage; and merchandising information. Running time is about 37 min. The 12-in., 33⅓ r.p.m records may be played on a microgroove or standard groove phonograph. For those using a silent slide film projector, a mimeographed copy of the script is enclosed for use by a narrator.

Let CREAM OF RICE help solve your modified diet problems

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Cream of Rice is rich in Iron, plus Vitamin B_1, Riboflavin and Niacin.

New Medical Study proves that Cream of Rice is *easier to digest than any other kind of cereal.* Gives quick food energy, too—within a few minutes after eating. Many pediatricians recommend it for growing children—and as one of baby's first solid foods.

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2

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Cream of Rice, a delicious, nourishing, easy-to-digest cereal, cooks in just ½ minute! New, easy-pouring spout!

3

CREAMY RICE TASTE

What's more, Cream of Rice is as delicious as it is nutritious. That's why it's so good as a breakfast cereal, too! Adults and children alike will enjoy its creamy deliciousness.

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Professional Sample

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An electrically-powered, 40-gal. steam-jacketed kettle has ben introduced by *Groen Mfg. Co.* A push-button control tilts the kettle forward or back only while the specific switch button is being pressed. A new, wider pouring lip, placed at a high pouring level, permits mobile carts holding secondary utensils to be filled at the kettle as well as measured control. The unit requires less space than standard tilting kettles. All steam pipes and electrical conduit are encased in easy-to-clean stainless steel housing. Six-in. tubular legs also make it easy to clean around and under the unit. Steam input is regulated by a control valve on the face of the housing.

A twin 1-gal. urn designed to replace automatic glass coffeemaker equipment is offered by *Continental Coffee Company.* The new urn is a pour-over type. Thermostat, urn bags, urn rings, two aluminum drip baskets, water inlet connections, union elbow, self-closing valve, gauge brush, urn brush, gallon measure, and bag plan are all standard equipment. Available in gas, electric, or steam models, the unit requires 4.1 cu. ft. space without and 5 cu. ft. with brewing baskets.

Five plastic food service trays with diner-tested designs are offered by *SiLite, Inc.* "Poplars," "Sunset," "Spice," "Summertime," and "Formal" are available in fourteen colors. Each tray is 14¼ by 18⅛ in.; will not warp or peel; resists staining; and is impervious to boiling, mild acids, and alkalis.

"How to Employ People" has been released as the second course in *Standard Brands'* popular program of "Tested Management Techniques." It follows the same format and employs the same type of audio-visual aids used in the older "How to Train" course. "How to Employ" covers all phases of employee selection, including recruiting, screening, interviewing, evaluating, and rating of job applicants. Emphasis is placed on techniques to be followed and pitfalls to avoid in interviewing. The showing requires a 2-hr. presentation. The "package" includes a color cartoon motion picture, three color filmstrips, and a black-and-white motion picture demonstrating the "wrong" and "right" ways to interview. Several pieces of printed material are also provided for distribution at the end of the presentation, including a wallet-size card listing "5 Basic Rules for Employee Recruiting" on one side and "5 Simple Steps in Employee Interviewing" on the other. The "How to Employ" course is not a single film or package of films available for purchase or rental. Information on presentations may be obtained from any local Standard Brands office of the Customer Service Department of the company's main office.

With a new frying pan, "T-Fal," recently put on the market by *T-Fal Corporation,* frying can be accomplished without the aid of added fat.

Here it is! The Brush You Asked for - The NEW

SPARTA "ATLAS"

MULTI-PURPOSE

No. 435A—Atlas Oval; 16" overall length.

Contacts with people at the Equipment shows and extensive surveys and research told us what you were looking for most in a multi-purpose brush! Out of this knowledge Sparta engineers developed the unique all-new ATLAS. Exclusive oval shaped head actually triples the working surface . . . Cleans three times faster . . . does more jobs easier, quicker.

Sharply angled thickly set TYNEX Nylon bristles slide right under and lift away the most stubborn residues. Snow white all-composition handle, grip and thong is entirely "soak-proof", super-sanitary. Tops for economy and utility. Replaces many special purpose brushes . . . lasts far longer . . . saves more time.

IDEAL FOR: coffee and tea urns, ice cream cylinders, stock pots, steam tables, trays and all general purpose wash-up.

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SPECIFY "Soak-Proofed" SPARTA

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CALIFORNIA VALENCIA ORANGE, GRAPEFRUIT, LEMONADE and BLENDED ORANGE and GRAPEFRUIT

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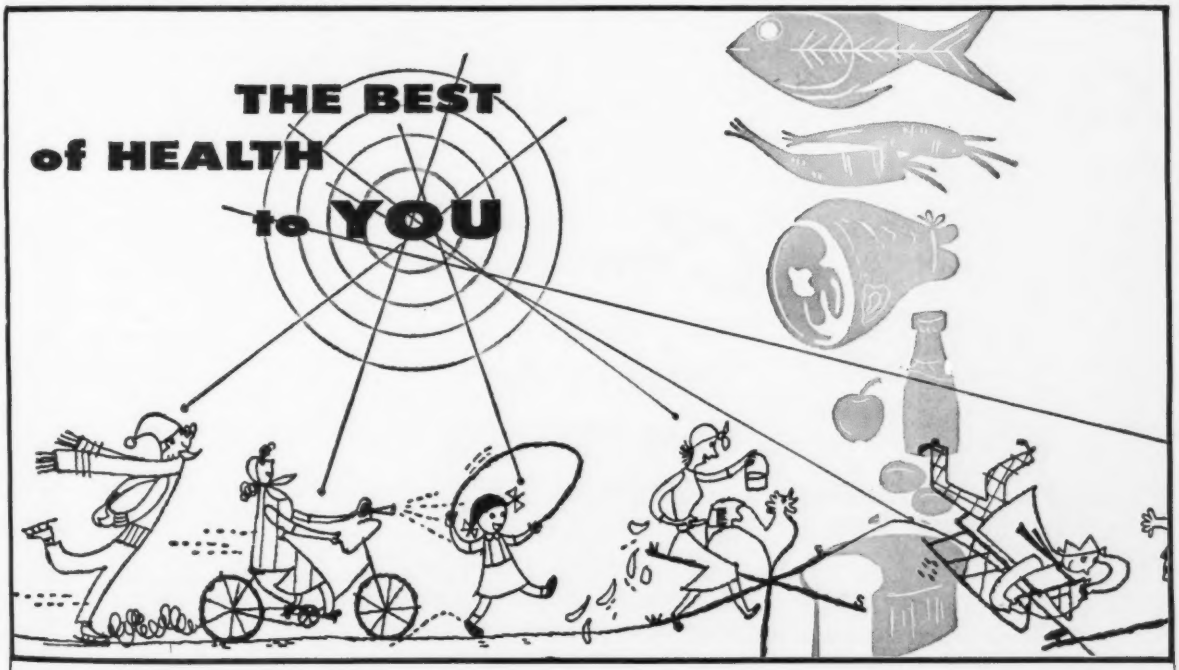

Make mealtime a pleasure time through the use of this everyday guide to normal nutrition. It offers meal patterns for adults and information on protective foods. Cheerful approach . . . . illustrated . . . . colorful. Single copies, 10 cents. Available in lots of 50 at $3.50 and lots of 100 at $5.00. *Send your orders to:*

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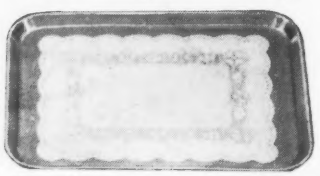

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The T-Fal pan is coated with DuPont plastic, "Teflon," which is unaffected by heat. Steaks, eggs, and other foods may be cooked in the pan without sticking and without grease. As a side benefit, the coating also makes the pans exceptionally easy to clean. The Food and Drug Administration has indicated that the Teflon resins, as used in the T-Fal pans, do not present any problems under the Food Additive Amendment.

A new motion picture, "Feel Free," is available for general use from *DuBois Chemicals, Inc.* In sound and full color, this 20-min., 16 mm. film is concerned with correct machine dishwashing procedures. Local DuBois representatives will be able to reserve the film, on request, for showings on specified dates, and if desired, assist with the presentation.

Reynolds Metals Company has introduced a clear, clinging plastic film in a new dispenser carton. The film is available in 1000- and 2000-ft. rolls in a choice of 12- or 18-in. widths.

The Wesson People have issued a new booklet, "Your Cholesterol Depressant Diet Cook Book," which is available for professional distribution. Designed for use with patients with elevated serum cholesterol, this booklet presents menus, recipes, shopping and cooking guidance, arranged according to three caloric levels—1200, 1800, and 2600—and at two levels of fat intake, termed "stringent" and "moderate" control. Dietery fat is controlled in these menus to provide approximately 36 per cent of total calories from fat, at least 40 per cent of which will be from polyunsaturated components. Menus for ten days and seventy recipes are included.

A new cup carrier designed to handle all models and cup shapes has been announced by the *Metropolitan Wire Goods Corporation.* Weighing 2½ lb., the carrier works in all self-leveling dispensers, on dollies, and in all dishwashing machines with 20-in. wide tracks. The square shape allows entry into the washing machine from any direction. Heavy plastisol coating of the steel reduces noise and breakage. The design allows stacking and compact nesting when empty.

Worthington Foods, Inc., announces a new food product, "Big Pat." Preformed, bun-sized patties looking and tasting like hamburger but containing no meat provide "natural" protein and the essential amino acids. Ingredients are: wheat protein, mushrooms, pecans, rolled oats, soya, milk protein, powdered whole egg, sunflower seeds, dehydrated onion and garlic, salt, monosodium glutamate, natural extractive flavorings, and corn oil. For preparation: remove Big Pats from container and fry over low burner until heated through (for extra tenderness, add water and steam for 30 seconds); crumble and add to chili or pizza, casseroles or loaves; or serve with a dressing. Big Pats are packed twelve to a can, twelve cans a case.

Cost is less than 8 cents a pat, including shipping charges.

"Totally refined" pastry shortenings are now being marketed by *Durkee Famous Foods*. According to a spokesman of the company, a new process, involving the refining of all ingredients in the pastry shortenings eliminates any chance of off flavors which could be carried through into baked goods. The new product is especially recommended for Danish and puff pastries.

Continental Coffee Company is offering a new and improved bleu cheese dressing. The recipe combines imported Danish bleu cheese with a mayonnaise-type base. In addition to normal use as a salad dressing, the company recommends the new product as a spread for sandwiches, or use especially with gelatin salads which contain crunchy, chopped fresh vegetables.

The third edition of *Turkey Handbook* may now be ordered from the National Turkey Federation. Prepared especially for use in the mass-feeding industry, this seventy-six-page, profusely illustrated booklet contains comprehensive information, with illustrations, on preparing and serving turkey in the school. Step-by-step pictures show how to make boneless turkey rolls in the school lunch program. There are, in addition, recipes specially planned for school use. One section tells about the nutritive value of turkey meat and its nutrient composition. Other information includes: where, when, and how to buy turkey; how to prepare the bird for roasting; best ways to roast small and large turkeys; and how to cut up turkey for roast-poaching and deep frying. A special, sixteen-page recipe section contains 122 recipes in quantity portions. Copies may be ordered for 50 cents each from the National Turkey Federation's office.

A new double sauce-server of contemporary design in stainless steel has been introduced by *John Sexton & Co.* The sauce bottles are of uniform size and style, with identifying color labels for quick and easy selection and to simplify inventory control. The server may be used at the table or in the kitchen. The design also minimizes dripping or spilling. Sexton sauces are Sirloin Club, Worcestershire, Mushroom, and Chop Suey.

New "Handy Wash" packets, individual wash and clean-up towels, have been introduced by *Van Brode Milling Co., Inc.* Each air-tight packet contains a folded disposable towel, premoistened with a mildly antiseptic cleansing solution which is non-irritating to the skin and air-dries almost instantly. The new handy wash packets eliminate the need for soap, water, towels, and finger bowls and save labor, linen, and wasted paper towels.

In "15 Star Desserts," an eight-page leaflet and the fourth in the "15" series by *National Canners Association*, quick and easy desserts from can or jar are pictured and recipes given. Ready to serve are baked apples; many fruits are sweetened and thickened ready to use in pastry and pie fillings or for cake and ice cream toppings; fruit and nut or chocolate rolls are good cold or heated and served plain or sauced; and plum, fig, and date puddings are table-ready. Many fruits are artificially sweetened or canned in fruit juice and/or water for calorie-conscious dieters.

Per capita consumption of breakfast cereals increased in the fifties from 6.9 to 7.6 lb., reflecting the trend toward moderate reduction of fat in the daily diet, according to *Cereal Institute, Inc.* "Cereals in the 60's," a six-page leaflet, presents a progress report of the cereal-and-milk breakfast, first investigated and summarized in the Iowa Breakfast Studies. An independent study discloses that a basic cereal breakfast is included in current health textbooks, public health, and extension materials.

An eight-page, illustrated folder from the *California Prune Advisory Board* offers interesting ways of using prunes to give variety to meals. Recipes and suggestions for sandwiches, main course dishes, salads, relishes, and desserts are included.

Pet Milk Company has announced the appointment of Joan Forrester as Test Kitchen Manager.

HANDBOOK OF DIET THERAPY

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- Descriptions of therapeutic diets
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The handbook includes new chapters on diet during pregnancy, adolescence, and old age; on energy expenditure; on fatty acid modifications; and on phenylalanine restrictions.

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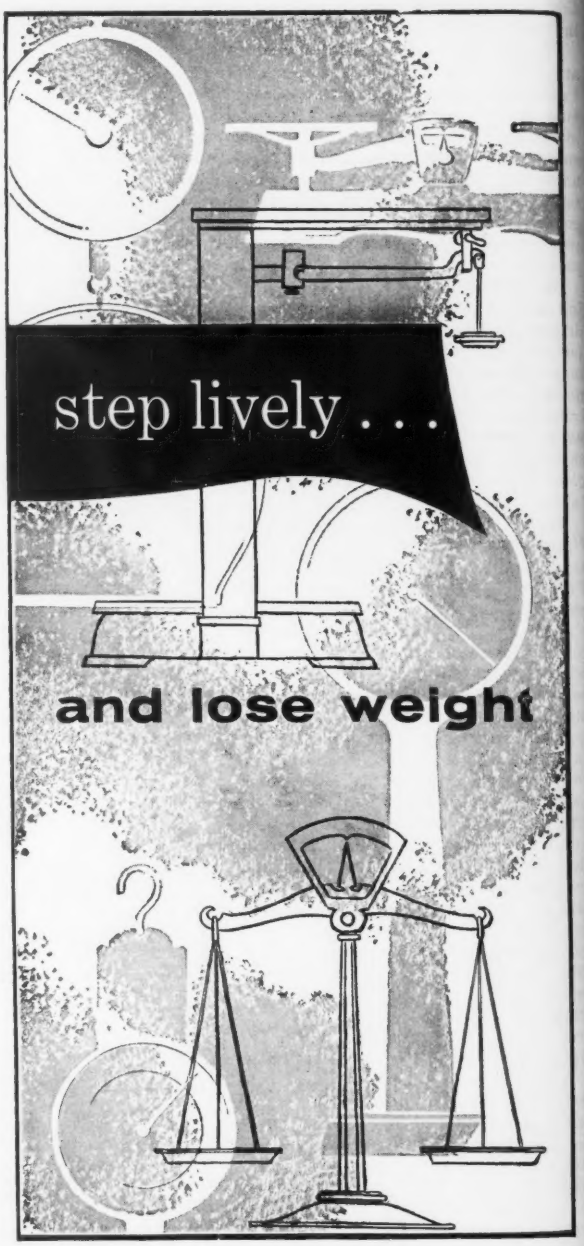

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